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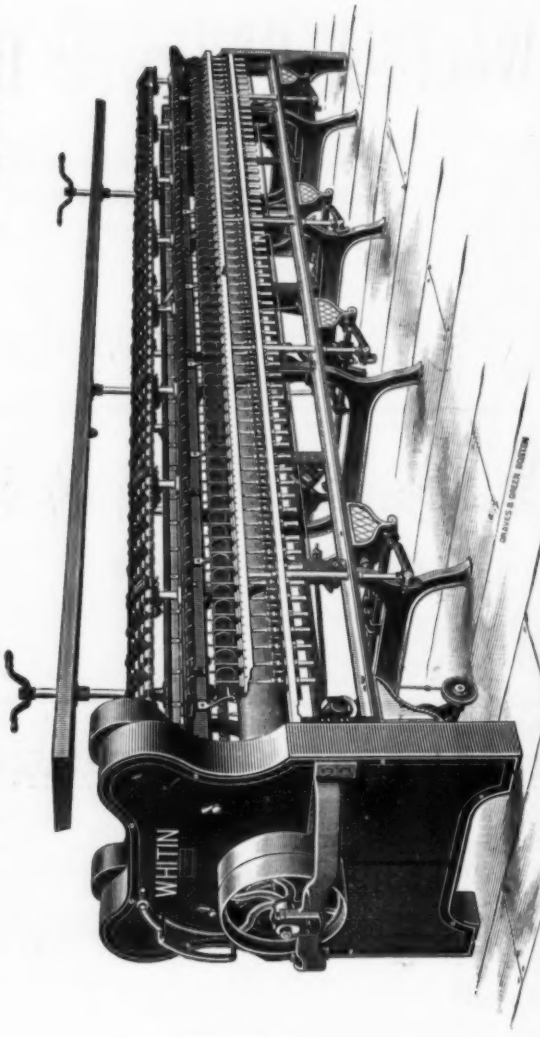

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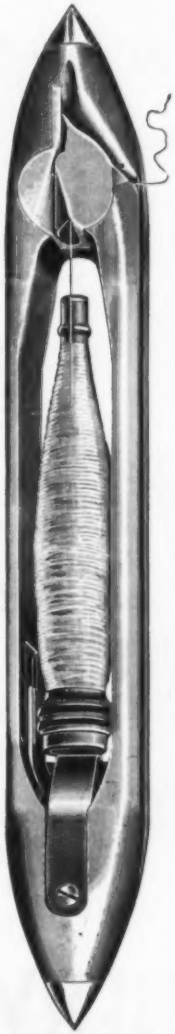

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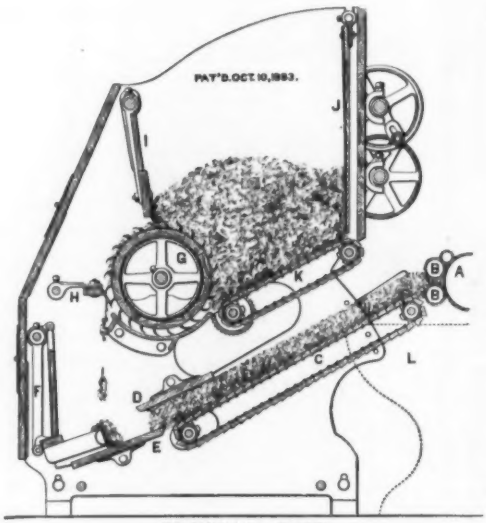

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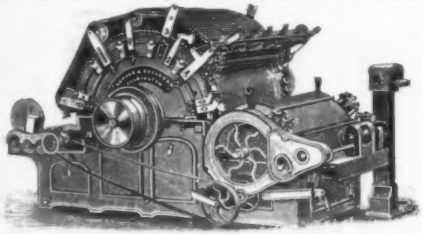

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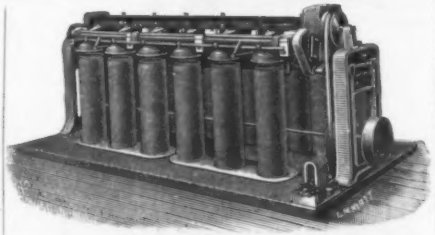

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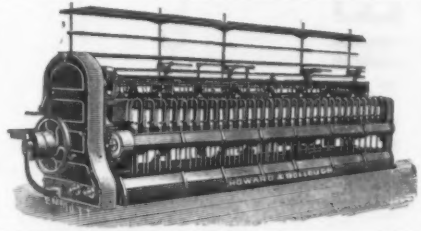

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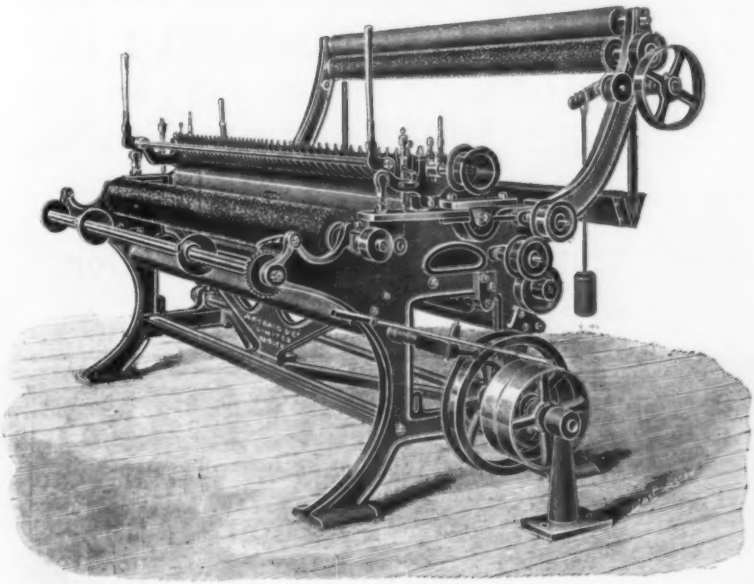

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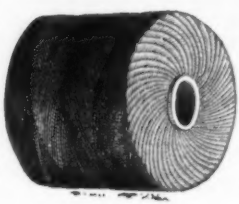

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List of Textile Patents Issued April, 1896.

Specifications and drawings furnished for fifteen cents each. Address "Patents," P. O. Box 222, Brooklyn, N. Y.

Apparatus for Washing Piece Goods. 558,690. C. L. Jackson and E. W. Hunt, Bolton, England.

Automatic Straight Knitting Machine. 557,641. J. Bennor, Macon, Ga.

Blue Dye. 558,344. H. A. Bernthsen and P. Julius, Ludwigshafen, Germany.

Bobbin. 557,873. G. Pendleton, Jr., New York, N. Y.

Carding Machine Doffer Comb. 559,285. R. W. Hilton, Pawtucket, R. I.

Carding Machine Stop Motion. 559,160. D. F. Bradbury and G. McDermott, Phila., Pa.

Cloth Napping Machine. 558,804. N. H. Grosselin, Sedan, France.

Cloth Striping Machine. 558,542. C. E. Wheeler, Cambridge, Mass.

Cloth Winding and Measuring Machine. 558,895. I. P. Cadman, Beloit, Wis.

Composition for Treating Fibre. 557,568. C. Efros, New York.

Double Faced Woven Pile Fabric. 558,160. J. Coley, Worcester, Mass.

Dyeing with Indigo. 559,163. E. Cavinati, Milan, Italy.

Fibre Napping Mechanism. 558,355. P. W. Cochrane, Spring City, Pa.

Fixing Dyes in Fabric. 558,718. H. L. Brevoort, Brooklyn, N. Y.

Knitted Fabric—Apparatus for Producing ornamental circular. 557,631. A. E. Adams, W. A. Sheffield and J. Hallam, Leicester, England.

Knitting Machine. 557,638. 557,639. J. Bennor, Macon, Ga.

Knitting Machine. 557,845. G. J. Manderfield and J. C. Brewin, Phila., Pa.

Knitting Machine. 559,327. H. Garant, Laconia, N. H.

Knitting Machine Needle Actuating jacks. 558,237. E. Tiffany, Bennington, Vermont.

Knitting Machine Sinker Actuating mechanism. 557,640. J. Bennor, Macon, Ga.

Loom. 557,998. J. H. Northrop, Hopedale, Mass., assignor to Geo. Draper & Sons, same place.

Loom Heddle Motion. 559,278. R. B. Goodyear, Phila., Pa.

Loom Let-off Mechanism. 558,274. M. T. Folsom, Manchester, N. H.

Loom Shuttle. 558,753. J. Allen, Paterson, N. J.

Loom Shuttle. 558,570. W. Sargentson and J. Gilbert, Hadfield, England.

Loom Shedding Mechanism. { 558,221. 558,222. A. Snoeck, Hartford, Conn.

Loom Shuttle Tension Device. 558,083. G. C. Koester, Paterson, N. J.

Loom Warp Stop Motion. 557,906. O. Smith, Bridgeton, N. J., assignor to Geo Northrop Loom Co., Hopedale, Mass.

Machine for Preparing Vegetable fibre. 559,009. T. Villamor, Merida, Mexico.

Needle Loom. 558,721. G. H. Cummings, Mystic, Conn.

Ornamental Fabric. 558,186. A. H. Kursheedt, New York.

Self Threading Loom Shuttle. 559,306. P. J. O'Connell, Hopedale, Mass., assignor to Geo. Draper & Sons.

Separating Mixed Fibres. 558,111. G. M. Qud and A. L. Rice, Worcester, Mass.

Shirt and Drawer Stretcher. 558,085. W. T. Lintner, Troy, N. Y., and W. C. Bull, Bennington, Vt.

Spindle and Bearing. 558,828. W. Moriarty, Jr., Fall River, Mass., assignor to Geo. Draper & Sons.

Spinning Machine. 557,688. J. A. Miller, Prov., R. I., assignor to Geo. Draper & Sons.

Spool or Bobbin Winding Machine. 557,620. W. H. Sissum, Belleville, N. J.

Spooling Machine Bobbin Holder. 558,893. S. N. Bourne, Manchester, N. H.

Stop Motion. 557,612. D. C. Ryder, Catskill, N. Y.

Teazling Machine. 558,798. E. Gessner, Aue, Germany.

Warp Doubling Machine. 558,411. J. MacCallum, Worcester, Mass.

Wool Washing Machine. 558,305. L. A. Peckham, Oswego Falls, New York.

Yarn or Thread Winding Machine. 558,314. E. H. Ryon, Waltham, Mass.

—Through H. G. McKerrow & Co., Boston, a line of Tweedales & Smalley's revolving top flat cards, speed and spinning frames have been installed in the Montmorency Cotton Mfg. Co., Montmorency Falls, P. Q.

—The American Machine Co., Pawtucket, have just finished the erection of picking machinery at the Hiawatha Mfg. Co., Gibsonville. They now have several contracts on hand for the South, amongst which are the Erwin Cotton Mills, Brookside Mills, Fulton Bag & Cotton Co., Union Cotton Mills, and others.

—A set of drawing, intermediate, roving and jack frames have been put into the Hargraves Mills, Fall River, Mass., by H. G. McKerrow & Co., Boston.

—Arthur L. Jacobs, of the firm of Arthur L. Jacobs & Co., who has made a specialty of sizing ingredients and apparatus for over ten years, advises us of having secured the account for America, one of the largest concerns in England, manufacturers of sizing ingredients, chemicals, etc. They invite correspondence.

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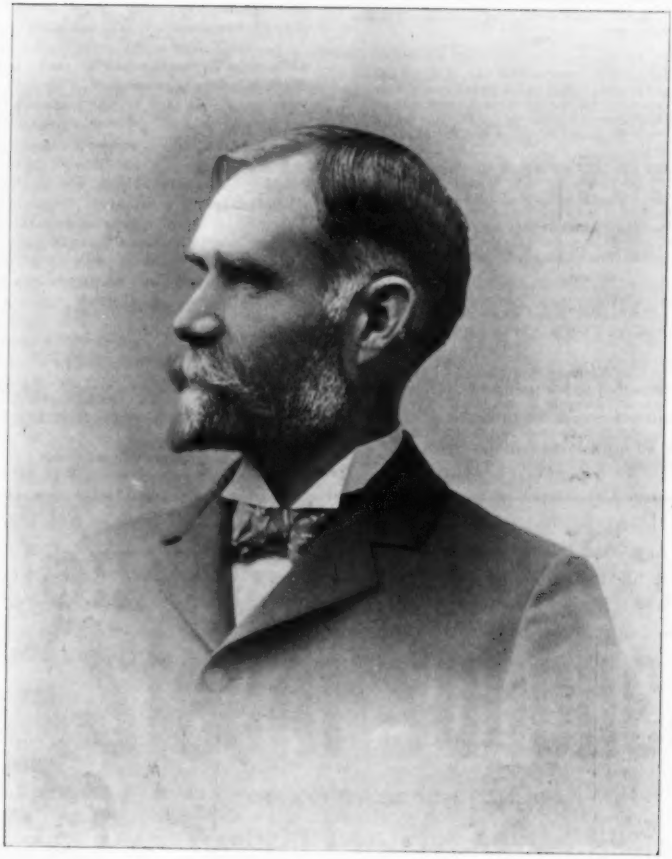

ARTHUR H. LOWE.

TEXTILE WORLD.

Vol. X. MAY, 1896. No. 5.

ARTHUR H. LOWE.

Elsewhere in this issue will be found the story of the annual meeting of the New England Cotton Manufacturers' Association. In this connection we are glad to be able to present a picture of the new president, Arthur H. Lowe of Fitchburg. He is a splendid illustration of the versatility and energy of New England business men, and the members made no mistake in elevating him to his present position.

He is the son of John and Sarah (Mead) Lowe, and was born in Rindge, N. H., Aug. 20, 1853. The family is of English ancestry, the first representative in this country settling in Essex County, Mass. Receiving his education in the common schools of Fitchburg, he was trained for the activities of life by hard work in helping his father support a family of 17 children, all of whom are alive at this time.

Mr. Lowe became a partner in the firm of Lowe Bros., provision dealers, at the age of 20, having previously had some experience in this line of trade with his father, who carried on a wholesale business. Gradually his attention was directed toward manufacturing, and in 1879, in conjunction with John Parkhill and Thomas R. B. Dole, he established the Parkhill Mfg. Co., of which he has since been the treasurer and manager. Six years later he organized the Cleghorn Mills Co., for the purpose of producing finer goods than the Parkhill Co. was making, and served as its treasurer until 1889, when this company, and also the Fitchburg Woolen Co. were absorbed by the Parkhill Mfg. Co.

To the success of the Parkhill Co., which has increased from 30 looms at the start to 2200 at the present time, being now the third largest of its kind in the country, Mr. Lowe has contributed his full share. They make ginghams, cotton dress goods, silks, worsteds, etc., and when running full, give employment to 1100 hands. Subsequently, Mr. Lowe became interested in the Grant Yarn Mill, the Fitchburg Steam Engine Co., and the Gas & Electric Co.

In the municipal affairs of Fitchburg, Mr. Lowe has always taken a deep interest, and has for many years been numbered among the prominent and influential citizens of the city. His first connection with the civil government was as alderman in 1888. In 1893 he was chosen mayor of the city, and the year was noted for the great activity in business affairs, and the progress accomplished. He was president of the Board of Trade for the two years immediately preceding his election to the mayoralty, and these years covered the period during which the growth of the city was most rapid.

The 12 months covered by his term of office as mayor were marked by the establishment of the new High School, the building of five miles of sewers, of two new fire stations, and of the Clarendon St. schoolhouse, also by the abolition of a prominent railroad crossing, and the purchase of 450 acres of land

for the site of the Burbank Hospital. On account of the pressure of his private business, he declined a re-election for a second term. In political affairs Mr. Lowe has always been known as a pronounced Republican, and has served as a delegate to numerous conventions.

The service rendered by Mr. Lowe in securing the location of the car shops of the Fitchburg railroad, the Orswell Mills, and the Mitchell Mfg. Co. for the city of Fitchburg, will always be pleasantly remembered by its citizens. He is a recognized force in the social affairs of the city, being a member and director of the Park Club, and a member of the Fitchburg Athletic Club.

Besides his connection with the woolen industry, Mr. Lowe is vice-president of the Fidelity Co-operative Bank, and is a director in the Fitchburg Savings Bank, the Fitchburg & Leominster St. Railway Co., and the Champion Card & Paper Co. He is one of the trustees of the Fitchburg Savings Bank, and a stockholder in the Grant Yarn Mill, and several other prominent Fitchburg corporations. He was appointed by Gov. Greenhalge, who was well acquainted with his interest in such institutions, one of the trustees of the hospital cottages for children at Baldwinsville. He has served for three years as one of the directors of the Cotton Manufacturers' Association, and his elevation to the presidency is a natural result of the faithful work performed in the subordinate capacity.

National Commercial Tariff Convention.

A call has been issued by a properly constituted and representative committee for a convention of the commercial, manufacturing, labor and agricultural organizations of the United States. The place is to be the city of Detroit, Mich., and the date of opening is to be Tuesday, June 2nd, the convention to continue from day to day, until the business brought before it shall be completed. The subjects to be brought up for action are:

First—The discussion of ways and means for taking the tariff question out of partisan politics and making it a business question, instead of a "political football."

Second—The discussion of ways and means for the improvement of the Consular Service of the United States and the employment of such service for the increasing of our foreign trade, especially with the central and southern republics.

Third—The advisability of recommending to Congress the creation of a department of Commerce, Manufactures and Labor, and of making the chief of such department a member of the President's cabinet.

Fourth—The advisability of forming a permanent organization for the purpose of holding annual conventions for the consideration of national questions and of recommending to Congress each year such changes in our laws or in their administration as may be deemed for the best interest of our country.

This convention is the outgrowth of the work carried on during the past two and a half years by the Tariff Commission League, under the personal direction of Samuel B. Archer, secretary and treasurer, of Newark, N. J. It will be non-political and non-sectional, and all questions are to be discussed from a purely commercial standpoint. The movement has received the endorsement of a large number of trade organizations, and it would seem as if the numerical success of the convention was already assured. If carried out according to the plans suggested by the promoters of the movement, it can hardly fail of giving a new impetus to the settlement of the questions included in the list of subjects, which will receive the cordial endorsement of all who wish to see a more permanent adjustment of these strictly business problems than is possible under present conditions.

Textile World

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Directory Issues.

The TEXTILE WORLD publishes four special issues during the year, which include directories of all the textile establishments in the United States, giving the name of mill, location, railroad connections, distances, officers, agent, superintendent, capacity of the mill, kind of goods made, whether there is water or steam power, whether there is a dye house or not, selling agent, and in many instances, the name of the man who does the buying. These directory issues are illustrated by specially prepared maps of the different states, showing the location of each city and town where there is a textile establishment, and only such towns are given.

This directory is the most complete and accurate published, regardless of price. Our perfect system of gathering statistics in connection with the TEXTILE WORLD, and the plan of rewards offered for corrections, as well as the system of revising the information quarterly, makes these directory issues unsurpassed.

We also publish a special issue containing directory of the manufacturing clothiers, cloak and suit makers, jobbers and large retailers buying from manufacturers. The directory issues are as follows:

Manufacturing Clothiers,	January	Number
Suit and Cloak Makers,	"	"
Jobbers and Large Buyers,	"	"
Middle States Mill Direct'ry,	April	"
South'rn and West'rn States,	July	"
New England States,	October	"

Subscription price of $2 per year includes all these special numbers without extra charge. Price of single copies of directory issues, 50 cents.

A Commercial Embassy.

The republics to the south of us have not relinquished their efforts to cultivate closer commercial relations with the United States, in spite of our curt and unexplainable abandonment of reciprocity. Brazil, Argentina and Uruguay have invited a committee of business men representing leading American interests to visit them the coming summer and study the opportunities for extending our trade with these progressive nations. This party is being organized by the National Associations of Manufacturers.

It would seem as if the times were favorable to the acceptance of this cordial invitation from our neighbors. A large amount of solid benefit would result from a closer acquaintance with the methods, the business men and the resources of three of the most important countries of South America.

Wool in the South.

As the South has been looked upon as the home of cotton, the idea of wool raising in that section of the country does not impress the casual observer as being in the natural order of things. Edward Atkinson says that nothing prevents the exportation of wool from certain parts of the South except the numberless cur dogs, which hinder wool growing on any extensive scale, and form the principal objection to the migration of Northern farmers to that region. He suggests as a substitute for the emblems and mottoes on their state seals, a cur dog rampant, with the words "Look out for the Dog." South Carolina has recently passed the most stringent dog law in the United States, and it is expected that Georgia will soon follow her example, and good results are looked for.

There are some sections of the South which are perfectly adapted for raising almost all varieties of sheep. With the dogs eliminated, we may expect to see

Southern wool an increasing factor in the wool markets. Georgia may become a rival of Texas, and South Carolina wool may attain greater prominence than sea island cotton.

Organization in the South.

The National Mule Spinners' Association has decided to send an organizer through the mill districts of the Southern states, for the purpose of forming branch associations in that section. Secretary Robert Howard, of the Spinners' Union, has been selected, and will probably make a trip through the South next fall, in connection with a general movement which will then be undertaken in the line of labor organization. Mr. Howard will represent the textile section, and the plan is to send two other delegates. This movement will be followed with interest by both manufacturers and employees, for one of the principal advantages claimed by the South has been its freedom from labor difficulties, and the absence of any labor organizations. Within the past few months, the labor difficulties at Columbus, Ga., and elsewhere, have indicated that freedom from strikes is not complete, and the effect brought about by the organization of labor upon the general conditions of manufacturing in the South, will be watched with interest.

Combine the Two Suggestions.

In closing his work for the year, President Goodale made a short address at the annual meeting of the New England Cotton Manufacturers' Association. One of his good points was the advisability of a closer co-operation between the men who are engaged in transferring cotton into cloth with the association of mill treasurers, and, if possible, to bring about a union of the kindred interests for their mutual benefit.

The new president, Mr. Lowe, suggested a broadening of the scope of the work, with a view of dropping the words "New England," and becoming the "American Cotton Manufacturers' Association."

It occurs to us to suggest a combination of the two ideas. If some plan of amalgamation could be arranged, which was mutually satisfactory, the name brought forward by Mr. Lowe would be eminently appropriate, and the value of the work done would be greatly enhanced. Probably neither of the gentlemen expected an immediate realization of his suggestion, but both ideas are in the line of progress for the association.

Style Suggestions for Woolen Manufacturers.

The only goods which are selling at present is a line of covert cloths, which are being taken by the cloak trade at $1.50, less five per cent. These goods are made to weigh 26 ounces, and the shades which are shown and sell are much lighter than those taken by the clothing trade. The lightest shades of tan and olive mixes are selling. These are being bought by this trade for July delivery.

The light weight covert business has narrowed down to a few pieces each day, and is gradually falling off. Quite a demand has sprung up for the imitation covert cloth, for fall trade, and orders are being placed for these by a few large houses.

The trade is generally very quiet, and very little disposition is shown to buy stock goods, which in better times would be considered bargains. The buyers of several large importing houses have returned from abroad, and almost all of them report a downward tendency in prices, and say that the mills in Bradford and Huddersfield are shutting down, and that goods can be purchased at the prices which prevailed at the opening of the last light weight season. Whether this downward tendency abroad will influence prices of domestic goods remains to be seen, but it is quite unlikely.

The opening of the light weight

season will be deferred as late as possible, many of the houses not wishing to show goods before August 1st, though this opening of samples will be controlled by the disposition of the buyer and not by the seller. There is a general impression throughout the market, that this will be a cheviot season and of this the demand gives ample proof. There is also a call for large plaids, and in light weights the only thing on the market, is a line made of coarse hairy "kemp" stock by the Plymouth and sold by Anderson. These goods are selling at 90 cents, and the market on this character of fabric, is well cleaned out. There will undoubtedly be a large sale of this fabric, and the manufacturer who makes both the goods and price right will dispose of considerable quantities.

The large plaids will also be demanded in all classes of cassimeres, particularly in the close finish fabrics, and there is also a call for stripes in the close finish cassimere, in melton face fabrics. The hairy cheviots spoken of are produced from stock which can be bought for eighteen or twenty cents, and can be put on the market very cheap.

The entire tendency in the direction of style is towards large checks and plaids, and broad stripes subdued in colors, so as to be effective, yet not conspicuous, as they were made some six or seven years ago.

Fibre Flax in Washington.

The December, 1895, issue of the TEXTILE WORLD contained an article showing the advantages of the Puget Sound region for the growth of flax. Dr. A. W. Thornton, the special agent for the investigation of fibre flax, has continued his experiments, and under the title of "Fibre Flax in Washington" has issued a valuable pamphlet on flax culture. He sets forth in plain language simple instructions which will enable the ordinary farmer to grow flax intelligently and successfully, and says we do not need to Europeanize the American, but to Americanize the European system.

"The first thing that will strike the observant farmer in examining the flax plant and observing its habit of growth, is that unlike wheat, oats or any of the grasses, which develop a vast number of fine fibrous roots near the surface, from whence they derive their nourishment, the flax plant sends down to the subsoil a single long tap root, with only a few very fine fibres, and instead of stooling out, sends up only one long, straight stem, branching out only after attaining a considerable height.

The requirements of the flax plant are a moderately fertile soil—such as will produce good grain crops—a cool, moist, equable climate; a deep, clean, well-tilled seed bed, with early sowing, and while it requires about the same amount of plant food that a fair crop of wheat will, yet as it takes its nourishment from a deeper strata of the soil than the wheat crop, it does *not* exhaust the land, as is generally supposed, in the same manner as grain does, if (mark that if) *the habits of the plant are fairly met.* This statement is, I am aware, apparently contrary to the experience of flax growers, and open to criticism; but the arguments in support of it would take up too much space in this bulletin."

After giving some points on growing flax, either for seed or fibre, as may be desired, or for both combined, Dr. Thornton goes on to say that any reasonably fertile soil will grow flax, though the quality of the fibre will be modified by the nature of the soil. The quantity of seed sown varies according to the purpose in view, from three pecks per acre, if for seed only for the oil mill, to three bushels for fibre purposes.

The principle that *flax must not succeed flax on the same land* is strongly emphasized, and suggestions for a proper rotation of crops is given. Flax, if grown for seed only, may be harvested very cheaply with a self-binding har-

vester, and the seed threshed out with an ordinary grain thresher having one of the concaves removed. If grown for fibre purposes, the flax must be *pulled*, and tied neatly in uniform bundles about 6 to 8 inches in diameter, with the butts all evenly set upon one plain, not "higgledy piggledy," sticking out irregularly, up and down the bunch for a foot or more. Carelessness in this particular will reduce the value of the crop at the mill by from $1 to $3 per ton. When the seed has reached the dough stage and is beginning to turn color, is the time to harvest the crop by pulling, which is an expensive process.

European and American systems of pulling and binding are contrasted to the advantage of the latter, the use of binder's twine being recommended. The closing paragraphs of the pamphlet are devoted to comparative estimates of the cost of growing flax for different purposes. The result would seem to be far more profitable than the farmer can ordinarily obtain at this time. If the ordinary farmer has learned how to set and hand-work flax, out of an acre that cost him $34.50 to grow, he can produce by hand work between 500 and 600 pounds of fine fibre, worth all the way from 10 to 40 cents per pound. This can be done without additional cash outlay, though with considerable expenditure of time and labor; but as the greater portion of this labor can be done in the house or barn in the winter time, and at spare hours, a material increase of income can be secured with the common facilities to be had upon the ordinary pioneer farm.

The practical results obtained from Dr. Thornton's experiments, would go to prove that flax can be profitably grown in the region around Puget Sound, and the indications are that flax culture will become a leading feature in the agricultural development of that section, at no very distant day.

The Woolen Industry of Italy.

The industrial statistics of 1876 gave all Italy but 2354 mechanical looms and 5989 hand looms. In the 20 years which have elapsed there has been considerable increase in the number of mechanical looms and a marked decrease in those operated by hand. It is calculated that there are now in the entire kingdom 6303 mechanical and 3685 hand looms, without estimating those at the home of the operators.

The mills of Italy number 431, with 121 steam and 406 hydraulic motors, and give work to 30,240 operatives. There are 11 spinning and combing mills, with 4258 operatives. The oldest and most important is that of Borgosesia, with annexed works for weaving, dyeing and other preparations; it now goes under the name of the Lanifici Rossi (Rossi Woolen Works).

In threads of combed wool, the production of the country is insufficient for the demands of the weaving and knitting establishments, there having been imported in 1893, 3992 quintals (of 220.46 pounds) of single yarn, and 6814 quintals of twisted yarn, and in 1894, 5322 quintals of single and 6996 of twist. This importation of combed thread shows the lack of spinning and combing establishments, owing to the great cost of the plants, which is not in harmony with the trifling distinction which exists between the customs tariff on carded and combed wool.

The following table will indirectly determine the advancement of Italian manufactories from 1864 to 1894:

Year.	Importations of— Thread-. Lire*	Textures. Lire*	Total. Lire*
1864	773,910	65,104,767	65,878,697
1874	1,601,300	50,383,756	51,888,116
1884	4,890,600	68,850,210	73,740,810
1894	8,384,054	34,653,555	43,037,609

* 1 lira=19.3 cents United States money, less the depreciated currency, at present eight per cent.

It will be noted that while the importations of threads almost doubled from 1884 to 1894, the importations of textures for the same years was practically cut in half. Estimating the output of each loom at 10,000 lire, will give a total annual value of 99,880,000 lire of Italian production. Adding 34,653,555 lire, the value of woolen texture introduced into Italy from foreign countries, and the internal consumption becomes established at 132,533,555 lire.

New England Cotton Manufacturers' Association.

The regular annual meeting of the association was held in Chipman hall, in the new Tremont Temple, Boston, Wednesday and Thursday, April 29th and 30th. This was the first public gathering to take place within the wall of the remodelled Tremont Temple, and Chipman hall seemed to be a typical place for such a convention.

There were probably 125 members present when President Alfred M. Goodale called the meeting to order promptly at eleven o'clock. Secretary Woodbury read the call for this meeting, and also the records of the last meeting, which takes in the whole of the Cotton States Exposition at Atlanta, Ga., last October. As he also acts in the capacity of treasurer, Secretary Woodbury then submitted the statement of the financial standing of the association, which showed receipts of $5003.55, expenditures of $3636.31, and net income of $1367.24. These figures exceed those of any previous year. The report further stated that there have been great accessions to membership recently. This meeting will close with a membership of about 450. The members of the Board of Government have had 12 regular and 3 adjourned meetings during the year. A seal has been designed for the association, bearing in its centre a loom of the pattern of 1865, the year of the founding of the organization. The centre is encircled by a wreath of cotton in full bloom, the right hand being Sea Island and the left hand upland cotton. The name of the New England Cotton Manufacturers' Association is surrounded by hanks of yarn knotted together, forming a polygonal border. There has been but one death during the year, that of Mr. Joseph Moyes, who fell in the mill, dying in the harness, like his fellow-member a year ago.

The reports offered by Mr. Woodbury were accepted, and a nominating committee appointed to bring in a list of officers for the ensuing year.

Following the example of his predecessor, President Goodale made a short opening address, in which the history of the past year's work was reviewed, special mention being made of the success of the semi-annual gathering at Atlanta. He then pictured out a prosperous and useful life for the organization, strongly advocating a broadening of the scope of the work done, and the co-operation of the body whose members are engaged in the transferring of cotton into cloth, with the association of mill treasurers, his idea being to amalgamate to the kindred interests for their mutual benefit. With the close of President Goodale's address, the meeting of Wednesday morning ended.

At the afternoon session the number of members was considerably increased. President Goodale expressed his pleasure at being able to introduce Hon. Josiah Quincy, Mayor of Boston, to the members, and took occasion to state his thanks at the courtesy shown by the City Government toward the association.

On rising to speak, Mayor Quincy was received with a round of applause. Among other things, he said he was glad that after meeting at other points, the association has come back to Boston as its meeting place, for he felt that the New England section should continue to hold the pre-eminence that it has held in the business of manufacturing cotton. The choice of Boston, as a meeting place, indicates that such continues to be a fact. Whatever may occur in the development of other sections of our country, he hoped that New England would continue to hold the first place, both in the competition and advancement. He said he was struck with the aims of the association, which make common property of the knowledge its members are gaining in the technical questions of cotton manufacturing, and the difference which this fact bears to the custom prevailing in

Europe, of keeping secret for individual gain new methods and improved processes.

The following candidates for membership were unanimously elected at this time.

John S. Adams, Adams, Mass.; W. N. Blackstone, Norwich, Ct.; E. E. Clark, Wilkinsonville, Mass.; P. Y. De Normandie, New Bedford, Mass.; John Drowne, Dover, N. H.; Wm. Evans, Fall River, Mass.; Daniel Gilligan, Fall River, Mass.; Joseph Warren Green, Hamilton, R. I.; W. G. Henderson, Norwich, Ct.; Walter H. Langshaw, New Bedford, Mass.; Roscoe S. Milliken, Lawrence, Mass.; Samuel L. Parker, Turners Falls, Mass.; Reuben Pilling, Jr., Greenville, R. I.; C. W. Rider, Holyoke, Mass.; Wm. A. Robinson, Savannah, Ga.; George H. Shapley, Boston, Mass.; Willis S. Shepard, Boston, Mass.; George E. Spofford, Natick, R. I.; C. H. Truesdale, Dayville, Ct.; Wm. D. Twiss, Lawrence, Mass.; Arthur W. Warren, Westfield, Mass.; Eben C. Willey, Manchaug, Mass.

Associate members: Colin C. Bell, N. Cambridge, Mass.; Wm. H. Bent, Taunton, Mass.; W. T. Bessonette, Temple, Tex.; J. F. Dickinson, Atlanta, Ga.; William L. Haines, Boston, Mass.; Jerome Hill, St. Louis, Mo.; Winthrop Thayer, Boston, Mass.; Frank H. Underwood, Boston, Mass.

The first paper at the afternoon session was on "Dobby and Jacquard Weaving," by George W. Stafford of Providence, R. I. It was illustrated by a series of views from the stereopticon, and was very well received by the members. The paper had been published in form of a 60 page pamphlet, containing numerous half tone cuts and was freely offered for distribution.

The topical question "What is the best motion for weaving Jacquard patterns, single or double action machines?" was answered by Wm. Evans. He said the best motion would depend on the character of the goods, but, on general principles, he was in favor of the double acting machine. The rise and fall machine was the best for the gauze weave.

"Is it profitable to use dobbies for over 20 harnesses, or is it better to use Jacquards?" was answered by John Eccles, superintendent Ponemah Mills, Taftville, Ct. He said that when over 20 harnesses were used, it was generally better to run the Jacquard. The extra space required for dobbies was hard on the weaver. His experience was that employees would choose easy work and less pay to hard work and more pay. The average weaver can run 4 dobbies and 5 Jacquards. More discussion followed, but nothing different from Mr. Eccles's opinion was expressed.

"Ought a manufacturer to receive more per pound for goods made on Jacquard looms than on dobby looms, both using same numbers, sley and picks being the same?" was answered by H. L. Pratt, agent Bates Mfg. Co., Lewiston, Me.

An interesting paper on weave sheds was read by James R. McColl, of Pawtucket, R. I. It was illustrated by large diagrams, showing what is known as the saw tooth construction, and also a combination of that system with the flat roof. The first form was not generally thought to be adopted to our New England climate owing to the large quantities of snow and ice which may accumulate between the ridges, but one New Bedford mill has lately decided to use this form of construction after a careful investigation of results obtained elsewhere. Mr. McColl did not claim to be an expert, still he contrived to communicate a large amount of useful information.

"The Northrop Loom" was the subject of a paper by Frank M. Messenger, N. Grosvenor Dale, Ct. In opening, he said, "I think it was Emerson who said 'When a new boy comes into school, or when into an old club a newcomer is domesticated, that happens

which befalls when a strange ox is driven into a pen or pasture, where cattle are kept. There is at once a trial of strength between the best pair of horns and the newcomer, and it is settled thenceforth which is the leader.'" He then went on to show how the Northrop loom had been introduced, stating briefly some of its successes, and giving complete data showing the capacity of the loom.

A letter was read from H. Wheat, of the Tucapau Mills, Gaffney, S. C., which bore the same testimony as the previous speaker. He said that on test they had gotten 97.83 of 100 per cent. of the product.

J. H. Hines of Burlington, Vt., said they were running 792 Northrop looms, and all were giving excellent satisfaction. They produced a little over a cut per loom per day, of the average Fall River length. The total cost of labor for weaving will average 1.9 per pound; slashing costs 9 1-2 cents per hundred pounds of yarn; drawingin, 15 cents per hundred pounds of yarn. Weavers are running 16, 20 and 24 looms respectively. The 24 loom weavers average 158 cuts per week, at 9 cents per cut. The overseers are now tending 80 looms each, but when they get everything running more systematically, they expect that 100 looms can be taken care of by one man. Having a new mill with new looms, they think they are getting very desirable results. The looms are run during the noon hour without attendance, and 70 per cent. of them are found running all right at bell time.

Gen. W. F. Draper was introduced at this time, and made an extemporaneous address on the virtues of the Northrop loom. He said in part, the Northrop loom had come to stay. The cost of weaving was half of the total in manufacturing cotton cloth. This cost, so far as the labor is concerned, can be cut one-half by the use of the Northrop loom. Weavers average to receive $60 per loom per year. On print cloths it is a little less. If half can be saved, unless something can be brought up to offset the apparent saving, much has been gained. He then gave illustrations from different mills, and in closing, said that some 6000 Northrop looms had been placed in different mills, and his company had under contract some 3500 more for future delivery. He intimated that there were other improvements in store which would make this loom even more valuable than in the past.

"Cotton Manufacturing in Switzerland" was the subject set down for Herr Th. Otto Schweitzer, Frauenfeld, Switzerland. This paper was not read, but copies were distributed to the members, and a vote of thanks was passed to the author.

The topical question "How many looms do Swiss cotton weavers run on fancy weaving, either Jacquard or dobby? Also, what numbers of warp and filling in same with speed of looms?" Speaking from memory of several years ago, Arnold Schaer, superintendent Warren Mfg. Co., Warren, R. I., said that the conditions were very much the same as in America, and that the points which would hold good here would also be true of Switzerland.

Chas. H. Fish, agent Cocheco Mfg. Co., Dover, N. H., read a number of tests which he had gathered from various members, showing the power required to drive various widths and makes of looms. His statistics covered different parts of New England, and were of much value for comparison.

Jerome Hill, who read a paper at the Atlanta Convention, was introduced, and spoke briefly about the cylindrical bale of cotton. He said that in 1890, he visited Europe, and passing around through the factories there several times, he had pointed out to him what was termed "America's disgrace," a bale of cotton. Since that time he had been looking into the subject of baling cotton, and had made numerous experiments under the Morse & Taylor sys-

met, and had come to the conclusion that the cylindrical bale would effect a revolution in the handling of cotton. It seemed to be just what is wanted to carry the cotton from the planter through all the different stages to the manufacturer. This can be done at a saving of from $3 to $4 per bale. He mentioned numerous points in favor of this form of cotton bales, and in closing, answered several queries regarding their use.

The convention then adjourned until Thursday morning.

A committee previously appointed brought in the following list of names for officers, and on being balloted for, they were declared unanimously elected:

President, Arthur H. Lowe, Fitchburg, Mass.; vice-presidents, Wm. J. Kent, New Bedford, Mass., Fred C. McDuffie, Boston, Mass.; directors, one year, Russell W. Eaton, Brunswick, Me.,; three years, Albert F. Knight, Adams, Mass., John Eccles, Taftville, Ct.

The first paper in the afternoon was by E. W. France, director Philadelphia Textile School. It was a masterly production, setting forth the value of "Technical Education in the Manufacture of Textiles." He said, that never before, perhaps, in the history of textile manufacturing in this country, has technical education, its needs and its importance, been more generally or more earnestly discussed than at the present time; and never before, perhaps, has there been such a need for superior intelligence and artistic skill in our labor, and in the manipulation of raw materials to their finished product, than at the present time. The query naturally arises, what has been the cause of all this discussion? The question can be truthfully answered by saying that it was brought about not only by the decay of the apprenticeship system, but also by the increasing demand for higher classes of production, coupled with the growing pressure of international competition under the new industrial conditions which the factory system has fastened upon modern civilization.

After describing the decay of the apprenticeship system, and analyzing the changes to the present factory system, he said, the people of America, even the great manufacturers themselves, are learning more or less rapidly this important lesson about the tariff, on the adjustment of which so much reliance has hitherto been placed. They are learning that industries which have been protected by the tariff *only* are only half protected, and that in numberless cases they are not protected at all; because they see that no matter how the price may be made by the tariff, the consumer will continue to pay it, if the imported wares are really better than the home product.

Textile workers, more especially designers, overseers, dyers and superintendents, must be trained, as only modern methods can train them, in a knowledge of approved methods and the reasons for their approval. The best talent which can be brought to bear is none too good for the textile industry of this country. With these points for a basis, Mr. France went on to speak of trade schools and technical education abroad, and then he told in detail the story of the Philadelphia Textile School, giving high praise to the work done by Theodore C. Search.

The next paper was on "Public Textile Education in Massachusetts," by the Hon. Frank P. Bennett, of Boston, Mass. He reviewed the efforts which have been made in the State to secure higher education for textile workers. In closing, he urged the appointment of three committees by the association: 1. A committee to promote the establishment of a college of textile science, with state aid, in connection with the Massachusetts Institute of Technology. 2. A committee to aid in every possible way the intermediate textile schools proposed in Lowell, New Bedford, Fall River and Lawrence. 3. A committee to act with the secretary of the board of

education in introducing some measure of rudimentary textile training in the public schools of the State.

On motion, a unanimous vote of thanks was passed to Mr. France and Mr. Bennett for the papers which they had read.

On the topical question "What benefit will the State of Massachusetts derive by the establishment of textile schools?" Nathaniel B. Kerr, superintendent Grinnell Mfg. Co., New Bedford, spoke of what had been accomplished in Germany and England. The textile school will benefit the textile worker by enlarging his mind and filling it with useful knowledge. It is not necessary now to spend seven years learning the trade. The American manufacturers adopt what has had a good run in Enropean markets, and are always one year behind. He emphasized the need of good overseers, and said capable men to run special departments were hard to find. Ambitious young men entering a mill became discouraged at the drudgery. By the aid of technical schools, they could start half way up the ladder. If we are to continue in the cotton manufacturing industry, it must be done by brains that are educated, and with artistic skill, so that we can adapt ourselves to the more advanced stages of textile schools, and in another decade we will have the best and most skillful textile workers in the country, and also greater diversity of textile work, on account of the inventive genius developed by such schools.

D. A. Tompkins, of Charlotte, N. C., was not present, and Mr. Woodbury announced that his paper on "The Future of Cotton Manufacturing in the South," would be found in the public proceedings of the meeting.

W. J. Kent, agent Wamsutta Mills, New Bedford, Mass., answered the topical question "How many ends per thousand spindles should be allowed to be broken down in a spinning room where the roving is furnished well prepared, and yarns vary in numbers from 20 to 80?"

A. F. Knight, agent Berkshire Mills, Adams, Mass., spoke on the same line as Mr. Kent, drawing from his experience when he was actually at work in the mill.

F. P. Vogel, agent Monadnock Mills, Claremont, N. H., answered the question "What means can be used to prevent the formation of anchor ice?" his paper being read by Secretary Woodbury. He said the best method he had found to accomplish this result was to carry a rope across the river, close to the level of the water, and fasten it in some suitable place above the dam. He had also dropped ropes across a river where anchor ice was forming, and had hindered the formation to a large extent.

The two questions "What is the quantity of steam properly required for slashers, and the best means of applying same?" and "What steam pressure should be carried on slashers running on colored work, and what is the best means of returning to boilers the condensation from slashers?" were answered by Chas. T. Main, of Boston, Mass., his paper being read by Secretary Woodbury. Mr. Main's points were further backed up by Wm. G. Nichols, superintendent of the Glasgow Mfg. Co., S. Hadley Falls, Mass. He added that he thought direct steam was better to use than exhaust steam, for the purpose named.

F. W. Dean, of Dean & Main, Boston, read a very practical paper in answer to the query "Can cotton manufacturers do more to prevent boiler explosions?" Following in the same line, George E. Tucker, agent Otis Co., Ware, Mass., read a short paper, which was evidently appreciated by the members.

On motion, a vote of thanks was passed to the city of Boston, for the kindness shown in providing an excursion for the members during the afternoon.

President Goodale then called upon Walter E. Parker, one of the past presidents of the association, to conduct President Lowe to the platform. On taking charge, Mr. Lowe expressed his thanks to the members of the association, and said he appreciated the high honor which had been paid him by his election. He assumed the responsibity of the work for the coming year with the understanding that it should be shared by all the members. The importance of the work before them was briefly stated, and he endorsed the principles set forth on the previous morning by the retiring president, and would only add the suggestion that the organization become the "American Cotton Manufacturers' Association," as it should widen the scope of its work, and advised the dropping of the word "New England." He spoke in a highly complimentary manner of the work done in the past year by Mr. Goodale, and said if he could in any way equal it, he should feel that he deserved the sincere thanks of the association. He then declared the meeting adjourned *sine die*.

In the afternoon, a number of members enjoyed the hospitality of the city in a trip down the harbor, and thus the convention reached its close. Taken as a whole, it was very successful in all its details. No small amount of praise should be given to Secretary Woodbury for his management of the affair, and for the smoothness with which everything passed off. He seemed indefatigable in his efforts to make the meeting a success, and only those who have passed through a similar experience realize the amount of work required to accomplish such a result. His work during the past year is more fully told in his reports as secretary and treasurer, but they show that the affairs of the association have been economically administered, and that the association is in as good shape to-day as at any time in its history.

By the courtesy of Gen. Francis A. Walker, L. L. D., president Massachusetts Institute of Technology, some examples of the work of the students in the Lowell School of Practical Design were on exhibition in the hall. The designs were very handsomely drawn, and covered cotton and wool goods, silk, paper, oil cloths, etc.

The Wealth-Producing Power of the Nation.

Under this comprehensive title, "The Voice" of New York, publishes the result of some investigations by its statistical editor, Geo. W. Waldron, which are both interesting and startling in their scope. Omitting the tables of figures and the suggestive diagrams, we insert a large share of the entire article.

"Americans believe in themselves. They may go to Paris and London for the latest styles in dress, but when it comes to solid results they have the supreme faith that no country on earth can get ahead of America. In the production of material wealth it cannot be denied that this country, since the civil war especially, has made wonderful strides. Census figures show that from a little over seven billions of wealth in the country in 1850, or $308 per capita, the total wealth in 1890 has swelled to 65 billions, or $1,039 per capita; so that in the 40 years total wealth has increased to nine-fold and per capita wealth is more than three times as great.

"All this points to marvelous productive powers in the nation, powers well worth study in the light of the recent census. How much wealth does this nation produce in a single year? In other words, what is the money cost of bringing all the material products of a year from the raw materials of the farm, forest, mine or water, through the various processes of manufacture, transportation and trade, until they reach the families or other consumers of the country?

"The basis of the investigation is the productive worker. According to the census of 1890 there were at that time 22,735,661 persons engaged in "gainful occupations." But not all of these are direct producers of wealth. The doctor,

the lawyer, the minister, for example, are useful members of society, and receive a share of the nation's products, but they are not *directly* engaged in adding to the nation's material wealth. A careful analysis of those engaged in 'gainful occupations' shows that in 1890 there were 20,115,106 persons directly productive of wealth. We have carefully subdivided these into classes as follows:

"In the production of raw materials from land and water, 9,725,445 workers; in manufacturing and mechanical industries, 6,643,879; in various forms of transportation, 1,557,721; in trade, 2,188,061. There is room for some difference of opinion in this classification, which might result in a modification of the estimates of the proportion of wealth produced by classes, but this would not materially affect the total production of all workers, which for 1890 is placed at $13,640,931,866."

A number of leading trade journals (among them the TEXTILE WORLD) were written to for information in one part of the investigations. The question was asked, "What is average per cent., above the cost of the goods, that is added by retail and wholesale merchants to their customers?" The article says:

"A careful analysis of these replies, with a leaning always toward the conservative, and giving each line of trade its proper proportion of weight, leads to the conclusion that the wholesaler, on the average, adds 10 per cent. to his purchasing price, and the retailer charges the consumer 25 per cent. additional, on the price paid by him to the wholesaler.

"A comparison of the estimates of the two census years brings out some striking results. The total product in 1890 is estimated at $13,640,931,866, which is $678 per worker, $1215 per worker's family, $217 per capita of total population, and $1075 per family, including non-producers. In 1880 the estimated production was $8,624,966,487, giving $552 per worker, $965 per worker's family, $172 per capita of total population, and $867 per family, including non-producers. The total gain of production in the 10 years is 58 per cent., while the per capita gain has been $45, or 26 per cent.

"Comparing the different classes, production of farm and other raw materials has made comparatively the least advance, dropping from 41.15 per cent. of the total product in 1880, to 30.19 per cent. in 1890. The largest developments have been in transportation and manufacturing. The products of the farm and forest only in 1880 were 36.38 per cent. of the total production. In the 10 years these gained less than 350 millions in value and dropped to 25.56 per cent. of total production. Farm products alone increased from 2213 millions to 2460 millions, a gain of less than 250 millions. The gain per farm worker was but $3—from $388 to $391. During the same time farm average wages have gone up $27. In 1880 farm capital, including live stock, farm implements and machinery, amounted to 12,603 millions, so that the gross gain in products was 17.56 per cent. In 1890, on the 15,982 millions of capital then invested in farms, the gross product amounted to 15.39 per cent.

"In wages there has been a marked gain. In 1880 wages absorbed 48.22 per cent. of the total product. In 1890 the per cent. had increased to 52.23. The absolute gain was even more marked. In 1880 wages per worker were but $266, in 1890 they were $354, a gain of over 33 per cent. in the 10 years. Wages per family have increased $169 during the period, from $465 in 1880 to $634 in 1890. While this gain in wages has been all along the line, it has been much less marked on the farm than in the villages and cities. On the farm the average gain in family wages has been $57—from $337 to $394, or 17 per cent. In all other lines of production the average gain has been $222 per family—from $604 to $826, a gain of nearly 37 per cent."

—The Fall River print cloth market touched low water mark in the latter part of March, with sales at 2¼ cents, and even in one instance less than that. The stock on hand is very large, and although there has been rather better inquiry, the immediate outlook is not pleasant. With cotton bought at today's price, and cloth sold at present quotations, no profit can be figured out.

PERSONAL RECORD.

Recent Changes.

In order to give all the news in this line, it is brought down to the mere facts; the name of the man is given first, the position he is holding, and the mill he is now employed in, follow next, while the place where he was previously engaged is given last, if the information is at hand.

George E. Hayes, superintendent, Savannah Cotton Mills, Savannah, Ga.; formerly of Greenville, N. H.

Frank Desautels, second hand spinning department, Utica Cotton Co., Utica, N. Y.; formerly same position with the Berkshire Mill, Adams, Mass.

George Atkinson, overseer carding department, Atherton Mills Co., Charlotte, N. C.; formerly same position with Charlotte Cotton Co., same place.

E. B. Hayden, superintendent of 10,000 spindle mill of the Prosperity Cotton Co., Prosperity, S. C.; formerly manager Old Colony Duck Mills, Chiltonville, Plymouth, Mass.

J. M. Helton, overseer carding and spinning, King's Mountain (N. C.) Cotton Mill; formerly held same position in Cowpens (S. C.) Mfg. Co.'s mills.

George Youtes, position at Fort Mill, S. C.; formerly of Burlington, S. C.

Robert Donaldson, overseer spinning department, mills 2 and 3 of the Laconia Co., Biddeford, Me.; formerly overseer Pepperell Mfg. Co., Biddeford, Me.

Paul Whelan, overseer carding, Auburn (N. Y.) Woolen Co.'s mill; formerly same position at the Uxbridge Mill, Uxbridge, Mass.

P. H. Tobin, overseer finishing room, E. S. Steven's mill, Quinebaug, Ct.; formerly of North Oxford, Mass.

W. H. Kelley, loom fixer, A. Priestly & Co., Camden, N. J.; formerly at Westvale (Mass.) Mills.

C. H. Bigelow, loom fixer, A. Priestly & Co., Camden, N. J.; formerly at Westvale (Mass.) Mills.

Edward D. Roy has accepted a position with the Drapers, of Hopedale, Mass., setting up machinery. Was formerly overseer weaving at the Clinton Mill, Clinton, Mass.

John J. Supple, boss dyer in a mill at Glenville, Ct.; formerly had similar position in mill of Milner & Co, Moosup, Ct.

William Walker, dyer at Columbiaville, Mich.; formerly of the Waverly Mills, Pittsfield, Me.

Gus. Raich, foreman, Washington Mill, Lawrence, Mass.; formerly of Rockville, Ct.

John Hillis, position in the Hockanum Mill, Rockville, Ct.; formerly with the New England Mill, same place.

W. C. Humphrey, position at Lockhart, S. C.; formerly loom fixer at the Elmira Mills, Burlington, N. C.

Thomas Oates, position in a mill at Cherokee, Pa.; formerly with the Dilling Mill, King's Mountain, N. C.

E. C. Burnhardt, superintendent, Reidsville (N. C.) Cotton Mills; formerly superintendent Asheville (N. C.) Cotton Mills.

Andrew Ballantyne, superintendent mill of Geo. H. Gilbert Mfg. Co., Ware, Mass.; formerly of Lisbon Falls, Me.

E. B. Stafford, charge of the white work, Appleton Mills, Lowell, Mass; formerly with the Lawrence Mill, Lowell, Mass.

Joseph Ridings, charge of wet finishing, Schaghticoke Woolen Co., Schaghticoke, N. Y.; formerly of Newburgh, N. Y.

Harry Pierson, charge of the Great Spring Mills, New Hope, Pa.; formerly of Lambertsville, N. J.

Joseph F. King, charge of dye house of Cranston Worsted Mills, Bristol, R. I.; formerly of Worcester, Mass.

Wylie Wright, charge of carding and spinning, mill of A. H Turner, Otter River, Mass.; formerly of Rochester, N. H.

Wm. Bailey, overseer finishing department, J. B. Dunn mills, Woonsocket, R. I.; formerly with the Rock Mills, Rockville, Ct.

J. T. Jackson, superintendent, Ashville Mill Ashville, N. C.; formerly had similar position at Lockhart Shoals (S. C.) Cotton Mill.

John Suttle, Peck's upper mill, Pittsfield, Mass.; formerly at Russell's mill, same city.

A. Morrison, manager, Hawthorne Mills, Carleton Place, Ont.; formerly of Markham Woolen Mills.

Jonathan Shea, Hockanum Mill, Rockville, Conn.; formerly of Plymouth, Mass.

John Numan, silk mill, Hackettstown, N. J.; formerly of Hallstead, N. Y.

Thomas Sharples, overseer mule and ring spinning and spooling, Moosup, Conn.; formerly second hand in mule room of cotton mill, Taftville, Conn.

George Hoover, silk mill, Hackettstown, N. J.; formerly of Hallstead, N. Y.

S. S. Campbell, overseer of carding, Mountain Island (N. C.) Cotton Mills; formerly of Charlotte (N. C.) Cotton Mills.

Wm. Denehy, dresser tender, R. H. Damon's mill, Westvale, Mass.; formerly of Lowell, Mass.

Samuel D. Peckham, superintendent, Glenark Knitting Co.'s new mill, Woonsocket, R. I.; formerly of Auburn, R. I.

Wm. E. Braley, designer, American Print Works, Fall River, Mass.

Walter Haigh, weaver, Camden (N. J.) Woolen Co.; formerly weaver, New England Mill, Rockville, Conn.

Joseph Stetson, Hockanum Mill, Rockville, Conn.; formerly of Leominster, Mass.

Squire Jackson, Springville Co., Rockville, Conn.; formerly of New England Mill, same town.

John Nuttall, overseer weaving, Newberry (S. C.) Cotton Mill; formerly overseer weaving, Maginnis Cotton Mills, New Orleans, La.

W. K. Sanborn, overseer weaving, Maginnis Cotton Mills, New Orleans, La.; formerly superintendent, Charlotte (N. C.) Cotton Mills.

Jerry Driscoll, card room, Geo. H. Gilbert Mfg. Co., Ware, Mass.; formerly of Franklin Falls, N. H.

William Gillespie, Slatersville (R. I.) Mill; formerly of Lewiston, Me.

Acceptances.

C. E. Cannon, overseer carding department, Victor Mill, Charlotte, N. C.

Joseph Stone, overseer spinning, Amesbury, Mass.

John P. Dabrie, overseer slashing and warping, Dominion Cotton Mills, Brantford, Ont.

E. W. Morgan, overseer carding, Blackstone, Mass.

J. D. Boseman, overseer carding, American Spinning Mill, Greenville, S. C.

Edward Lyon, second hand weaving, Lyman Cotton Mills, Holyoke, Mass.

W. J. Herbage, engineer Chaplin Silk Mills, Whitehall, N. Y.

Mr. Spaulding, engineer, St. Ronan's Woolen Mill, Sangerville, Me.

Elmer Goslee, position with the Crosby Mfg Co., E. Glastonbury, Ct.

Hugh McDonald, loom fixer, Ayrshire Woolen Mills, Skaneateles, N. Y.

Joseph Sykes, designer, Oldtown (Me.) Woolen Co.

Dennis O'Brien, overseer finishing room, Glen Woolen Mills, Norwich, Ct.

Anton Millar, boss dyer, Isaetta Mfg. Co., Augusta, Ga.

Thomas Thomas, overseer spinning, Fort Mill (S. C.) Mfg. Co.

W. P. Hurt, day superintendent, Patterson's Factory, Patterson, S. C.; O. R. Helderman, night superintendent.

Wm. Dennehy, dresser tender, R. H. Damon, Westvale, Mass.

W. E. Robinson, superintendent, Dixie Cotton Mills, La Grange, Ga.

S. S. Campbell, overseer carding, Mountain Island (N. C.) Cotton Mills.

E. J. Barrett, overseer weaving at new cotton mill, Gaffney, N. C.

W. A. Powell, second hand spinning room, Anniston (Ala.) Mfg. Co.

Elizabeth Gately, overseer finishing room, Valley Mill, Cherry Valley, Mass.

Philip Masterson, watchman, No. 1 mill, Waterford, R. I.

Thomas Carless, silk tapestry designer, Cheney Bros., Manchester, Conn.

George Nason, Owen's Mill, Hope Valley, R. I.

C. F. Hislop, superintendent, Buffalo Thread Mills, Concord, N. C.

Joseph Sykes, designer, Old Town (Me.) Woolen Co.'s mill.

C. E. Beale, night superintendent, Ledbetter Cotton Mill, Rockingham, N. C.

C. T. Booth, overseer dyeing and finishing, Pacific Print Works, Lawrence, Mass.

E. B. Stafford, overseer weaving, Appleton Co., Lowell, Mass.

Thomas Smith, overseer weaving and finishing, J. B. Dunn's mill, Woonsocket, R. I.

Resignations.

G. W. Hurd, employee mill finishing room, Indian Spring Mill, Madison, Me. Has gone into the insurance business in Philadelphia.

C. J. Stafford and Robert E. Jackson have resigned their positions in the silk mill at Rockville, Ct.

Robert Crompton has resigned his position at the cotton mill, Moosup, Ct., and has gone to his farm at N. Scituate, R. I.

Andrew Douglass, superintendent, Astoronga Knitting Mill, Little Falls, N. Y.

Alfred Clark has severed his connection with the Glastonbury Knitting Co., Glastonbury, Ct.

W. Gould, overseer cloth room at Farwell Mills, Lisbon, Me.

John Manning, position in dyehouse, Peck's lower mill, Pittsfield. Mass.

Jerry Connors, Wm. Clark Thread Co., Westerly, R. I.

W. C. Hutchins, overseer Boott Mill, Lowell, Mass., after sixteen years' service.

Herbert Merwin, position in finishing room, Taft, Murdock & Co., Caryville, Mass.

Wm. Service, overseer, Wright's Knitting Mill, Pownal, Vt.

Samuel Barrett, overseer, Pacific Print Works, Lowell, Mass.

John Casey, boss carder, Baltic Mills, Enfield, N. H.

J. M. Splawn, boss spinner, Spartan Mill, Spartanburg, S. C.

Henry Harding, overseer dressing department, American Mills, Rockville, Ct.

James Boeman, position in the Hockanum Mills, Rockville, Ct.

James Freeland, position with Montville Woolen Co., Montville, Ct.

H. E. Davis, overseer weave room, No. 2 Mill, Thorndike, Mass.

J. W. Black, Huguenot Cotton Mill, Greenville, S. C.

Timothy Donahue, night watchman, Oriental Print Works, Apponaug, R. I.

Samuel Barrett, overseer, Pacific Print Works, Lawrence, Mass.

E. Woods, second hand weaving department, Maginnis Cotton Mills, New Orleans, La.

Jonathan Williams, overseer No. 5 mill, Lawrence Mfg. Co., Lowell, Mass.

J. J. Quinn, overseer weaving and finishing, John B. Dunn's mill, Woonsocket, R. I.

John Darling, overseer weaving, Rawitser Bros.'s mill, Stafford Springs, Conn.

James Beauman, Hockanum Mill, Rockville, Conn. Has gone to Fitchburg, Mass.

Elmer E. Latham, Allyn Spool & Printing Co., Mystic, Conn.

Michael H. Feeley, boss dyer, Pontoosuc Mill, Pittsfield, Mass.

F. T. Ashton, Hinsdale Bros., Hinsdale, Mass.

Charles Johnson, weave room, Pontoosuc Mill, Pittsfield, Mass. Has gone to Glenville, Conn.

David Dawley, B. B. & R. Knight's bleachery, Pontiac, R. I.

Henry Harding, overseer dressing department, American Mills, Rockville, Conn.

Charles Sengman, Shetucket Co.'s mill, Norwich, Conn.

Frank Hill, overseer finishing, Cooper Mfg. Co., Bennington, Vt.

Ezekiel James, Glasgo Thread Mill, Ashwillett, Conn.

H. E. Davis, overseer weave room, Thorndike Co.'s No. 2 mill, Thorndike, Mass.

Simon McDonald, Manchaug (Mass.) Mill, formerly boiler tender, Hamilton Woolen Co.'s mill, Globe Village, Mass.

Thomas Ayrey, for 40 years an employee of the Pacific Mills, Lawrence, Mass.

H. J. Maloney, boss carder, New Britain (Conn.) Knitting Co.

Promotions.

Oscar Perry, promoted to second hand, Madison, (Me.) Mill.

John E. Custer, superintendent, Buell Woolen Mill, St. Joseph, Mo., was elected alderman at the city election by over 1000 majority.

C. F. Mason has been made overseer carding at the Statesville Cotton Mills, Statesville, N. C.

Wm. A. Eastman, superintendent Lowell (Mass.) Hosiery Co., has been promoted to the office of treasurer.

C. T. Upton, head draughtsman, Lawrence Mfg. Co., has been made superintendent Lowell (Mass.) Hosiery Co.

John Cronin has been promoted from dyer and scourer to overseer carding and spinning, Flynn Bros. Mill, Emlenton, Pa.

Lincoln Godfrey has been made executive head of the Eddystone Print Works (Wm. Simpson, Sons & Co.), in place of Wm. Simpson, Jr., recently deceased.

C. R. Lockman promoted from second hand to overseer spinning, Spartan Mills, Spartanburg, S. C.

George Wey has been promoted from overseer weaving department to superintendent, Lambton Woolen Mills, Lambton Mills, Ont.

Here are two items telling the story of well-deserved promotions:

Treasurer Wood, of the Washington Mills, Lawrence, Mass., has been elected a delegate to the Republican national convention from the fifth congressional district.

Leontine Lincoln, of the well known firm of Kilburn, Lincoln & Co., loom builders, Fall River, Mass., has been elected a delegate to St. Louis to nominate the next president, in June.

Presentations.

John T. Kirk, on resigning his position as second hand in the Pierce Mill weave room, New Bedford, Mass., was presented by the employees in the weave room with a gold watch, chain, Masonic charm, meerchaum pipe, cigar case and traveling bag.

Alfred Hurst, formerly overseer at the Methuen Co.'s mill, Methuen, Mass., was recently surprised at his residence by a number of his former employees, who presented him with a handsome Morris easy chair.

J. G. Buttrick, retiring treasurer of the Thorndike Mfg. Co., Lowell, Mass., was presented with a gold headed cane by the employees.

Marriages.

Sigmund Muhlhauser, manager of the F. Muhlhauser Company, Cleveland, Ohio, was married to Miss Rose Hirsch, of New Brunswick, N. J., in this city. The wedding was celebrated at 641 Lexington Ave., the ceremony being performed by the Rev. David Weiss.

Charles B. Heathcote, clerk at the Iron Works Co.'s mill, Fall River, Mass., and Lena A. Macomber, daughter of James P. Macomber.

Deaths.

William Coughlen, 76, Indianapolis, Ind. In early life he learned the business of manufacturing woolen goods, working in several New England cities. He moved to Indianapolis in 1856, and until 1881 was a member of the firm of Merritt & Coughlen, woolen manufacturers. Later he was president of the Indianapolis National Bank.

John Jacob Tobbler, for 30 years foreman of one of the rooms at the Arrowanna Mills, Staddle Hill, Conn.

Robert Dobson, woolen manufacturer, Pittsfield, Me. He was of Scotch descent and came to this country in 1856. From small beginnings he built up a successful business.

Henry Burgoyne Wilson, a silent partner in the firm of Dexter, Lampart & Co., silk manufacturers, New York.

Daniel F. Mitchell, 39, until recently superintendent at Hall Bros.' woolen mill, Norwich, Conn. He was a competent designer, and had been employed at the Berkshire Woolen Co., Everett Woolen Co. and other mills.

Artemus W. Stearns, 80, president and treasurer of the Wright Mfg. Co., Lawrence, Mass. He was one of the wealthiest and best known dry goods merchants in the city, having an unblemished record for over half a century of business life.

Charles T. Evans, 60, for many years with the Camden Woolen Mills, and more recently with J. R. Keim & Co., Philadelphia, Pa.

Thomas M. Holt, 65, Haw River, N. C. He had served two years as governor of the state, was the largest cotton goods manufacturer, and one of North Carolina's richest citizens. The village of Haw River is mainly the creation of the genius and industry of Mr. Holt.

John Gannon, 55, Passaic, N. J. He was probably the most expert printer of fabrics in America, and is given credit for being the first American to print fast colors on silk.

James J. Walworth, 87, president of the Walworth Mfg. Co., Boston. He had held the office of president of the corporation for many years, and was highly esteemed in business circles.

Patrick Barton, 56, spinner at A. Howarth & Son's mills, Rochdale, Mass.

F. L. Knox, 70, formerly overseer at Manchaug, R. I.

Samuel S. Myers, 48, manager of the Tiffin Woolen Mills, Tiffin, O.

Ernst Sehlbach, 47, formerly head of the firm of E. Sehlbach & Co., now Farbenfabriken of Elberfeld Co. He was favorably known in this country and everywhere respected.

J. H. Mower, machinist, Continental Mills, Lewiston, Me.

James Dunn, 70, employee of the Whitin Machine Works, Whitinsville, Mass.

Philip D. Borden, 80, treasurer of the American Linen Co., Fall River, Mass. He was the oldest active manufacturer in the city, and for many years was in charge of the Fall River Iron Works Co.

L. H. Brigham, 79, Palmer, Mass. He was at one time superintendent of the Dwight Mills, at Chicopee, and for 29 years was agent of the Ludlow Mills, a position he filled in a most satisfactory manner.

—E. B. Martin, a well-known Galveston commercial traveler, has in his posession a curio of interest to students of sea island cotton culture. It is a sea island cotton stalk grown at Port Lavaca, Texas, in black soil five feet deep. It is a relic of the crop of 1893, and is said to have been the largest on record in the world, standing 12 feet high, and measuring 19 feet across. It produced 649 well developed bolls, as carefully counted by a committee. The stalk, which Mr. Martin carries as a souvenir of this monarch, is about five feet long, and a little over an inch in diameter at the base.

—Attention is directed to the card of the Oakes Manufacturing Co. elsewhere in this issue. The principal office is at 58 Stone St., New York, but for the convenience of customers, branches have been established at Boston, Philadelphia and Atlanta. They are manufacturers and importers of pure extracts of dye woods and dye liquors, and make a specialty of pure hematine, in liquid, paste or solid form. Correspondence is solicited from mill men in all parts of the country.

QUESTIONS AND ANSWERS.

Under this head we shall undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Galloon Bindings.

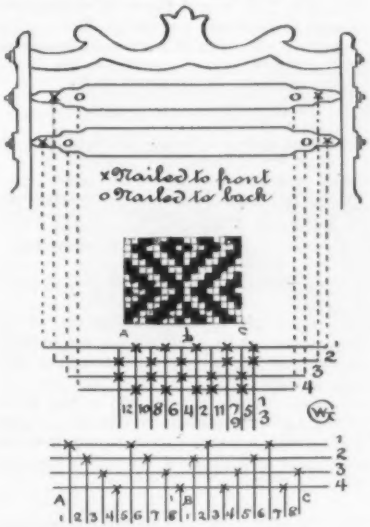
BOSTON, April 28, 1896.

Editor Textile World:

Can you put us in communication with manufacturers of galloon bindings, similar to enclosed sample?

Yours very truly,
M. H. M.

[We would suggest that you correspond with H. M. Witter & Co., of Worcester, Mass., who make a line of galloons similar to sample sent.]



Strapping for Roller Looms.

—NEW YORK.

Editor Textile World:

Would you kindly send strapping and draft for enclosed samples? T. HART.

[Samples No. 1 and No. 2 are identical in construction, the same weave being used for both samples, the only difference being in the drawing-in of the warp.

Sample No. 1 is a herring bone effect and is woven on the portion *A*, *B*, of the weave shown in the design. The drawing-in draft is shown below, and the section *A*, *B*, of the drawing-in draft corresponds with this portion of the weave. For sample No. 1 the warp is drawn on a straight on four harness, and the weave repeats on four ends and twelve picks.

Sample No. 2 is identical with No. 1 except that the weave is reversed in the second portion.

No. 2 requires the weave from *A*, *C*, and the drawing-in draft is also shown below from *A* to *B*. The first eight ends are woven same as No. 1, and are drawn in regular order on the four harness. These eight constitute one half of the pattern. The second half being the reverse of the first half, the ends are drawn the reverse way, starting on the second harness, then the first, then fourth, third, second, first, fourth, third, until the second eight ends are used, thus making a pattern which repeats on sixteen ends and twelve picks, but by means of this draw can be woven on four harness.

The changes in both patterns being alike, the same strapping is used for both. The straps marked *x* are nailed to the front of the roller, and those marked *o* to the back.

Percentage of Worsted Noils.

BENNINGTON, VT., April 30, 1896.

Editor Textile World:

Will you kindly advise me through the TEXTILE WORLD as to the percentage of noils and waste made in a worsted mill. Thanking you in advance, I am

Yours very truly, H. G.

[The percentage of noils made in combing wool depends largely upon the stock, so that no figure can be given which will cover all cases. So many circumstances enter into the working of wool that probably no two mills would get exactly the same results. The waste depends largely on the preparation before carding, condition of the cards, combs, etc. Assuming favorable conditions, and fairly clean stock, domestic 1/4 blood or 3/8, the card waste should not show over two to three per cent. Usually this can be run in again, so that at the finish, little except seeds, shives, and such waste, carrying some wool along with it, should be left. For combing waste, ten per cent. is a good result of noil from 100 pounds of clean stock. A little lap waste will be made as the lot runs out on the comb, which can be worked over again. The above is on white work.]

Two Ply No. 10.

MASSACHUSETTS, May 11, 1896.

Editor Textile World:

Can you give us the address of a mill making two-ply No. 10 Egyptian cotton? We find that most of the mills represented in Boston do not make so low a number, but we note it is quoted in your paper. Kindly favor us, and oblige W. Co.

[We would refer you to the advertising columns of the TEXTILE WORLD, wherein you will find several concerns who can furnish you with what you want.]

Twist Per Inch for Hosiery Yarns.

NORTH CAROLINA, April 27, 1896.

Editor Textile World:

Will you please tell us how much twist per inch manufacturers put in hosiery yarns from 6s to 20s? H. P. MFG. CO.

[It makes quite a difference what kind of cotton is used. We think the rule most generally employed is as follows: For fair staple and clean cotton, double roving, multiply the square root of the number by 2.50, which will give the twist per inch. Taking 2.50 as a constant, the practice of spinners varies from that up to 2.75. For Egyptian cotton, 2.50 is generally employed as the constant number, and with Sea Island it goes as low as 2.25; in other words, the twist per inch ranges from 6.71 turns per inch for No. 6 yarns up to 12.29 for No. 20s, using common hosiery cotton. The better the cotton, the less twist is required.

Dyeing Variegated Colors.

MASSACHUSETTS, April 26, 1896.

Editor Textile World:

I would be pleased to receive suggestions from you as to the best methods of dyeing variegated colors on single hosiery yarn, as per sample enclosed. T. B.

[We are of the opinion that the variegated colors on the samples you enclose are produced by printing, not by dyeing. Many beautiful effects are produced in yarn printing, and from close inspection of your sample we are of the opinion that it is treated in this way, and having shown it to several other persons who are in position to know, they agree with us.]

Worn Valve Stem.

Editor Textile World:

I have a valve stem that is badly worn where it passes through the stuffing box. Please give the most economical way to repair it, using Babbitt metal.

Natick, Mass. ENGINEER.

[Have the stem turned off parallel in a lathe. Then recess out the gland and neck ring and Babbitt them, using the valve stem for a mandrel. Or else bush up the gland and neck ring with brass bushings.

The above, of course, would not apply if the stem, after being turned off, would be too weak to do its work.

In that case a new stem would be required.]

Blowing Off Boilers.

Editor Textile World:

In a horizontal tubular boiler, at what distance from the blow-off pipe will loose scale or sediment be removed from shell by opening the blow-off at 60 pounds pressure, and also with no pressure on the boilers?

[In some cases, in opening up a boiler, large pieces of scale will be found lodged quite close to the blow-off pipe, the boiler having been blown a gauge every day. In other cases all the loose scale will be found near the front ends, so that it would be mere supposition to give any stated distance from the blow-off pipe that the effect would be felt. This would also apply in removing sediment.]

Textile Statistics of Southern States.

CHARLOTTE, N. C., April 27, 1896.

Editor Textile World:

Will you kindly advise us as to the number of spindles and looms in the Southern States. Of course we understand that you must estimate this, but we assume you to be in the best position to give us approximately the correct figures. D. A. TOMPKINS CO.

[On January 1st we estimated the number of cotton spindles in the United States to be 16,500,000, divided as follows: Southern States, 2,700,000; the rest of the country, 13,800,000. We should judge the Southern States had gained 150,000, possibly 200,000, since the first of the year. We estimate approximately the number of cotton looms in the United States to be 360,000. Of these, we should give the Southern States 50,000. This is rather less than their proportionate amount in relation to spindles, but we believe the proportion of mills with looms to those without looms is smaller in the Southern States than in the North.]

Velocity of Steam Pressure.

Editor Textile World:

Dear Sir: How do you determine the velocity with which steam of one pressure will flow into another pressure?

Fairhaven, Mass. INQUIRER.

[Steam of any pressure flowing through an opening into any other pressure, which is less than 58 per cent. of the initial pressure, has practically a constant velocity of 888 feet per second, or a little over ten miles a minute, and the weight of steam that will escape into a space in which the pressure does not exceed 58 per cent. of the gross pressure of the steam is, in 70 seconds, equal to the gross pressure of the steam, upon an area equal to the area of the orifice through which it flows.

—While general business, and especially woolen manufacturing is affected unfavorably by the approaching presidential campaign, with its attendant uncertainties, there is one branch of the business, viz., the manufacture of bunting, which finds political activity a decided spur to its business. From present indications, the American flag will wave this summer and autumn as it has never waved before, and the bunting manufacturers are generally well employed, to fill the liberal orders that they are receiving.

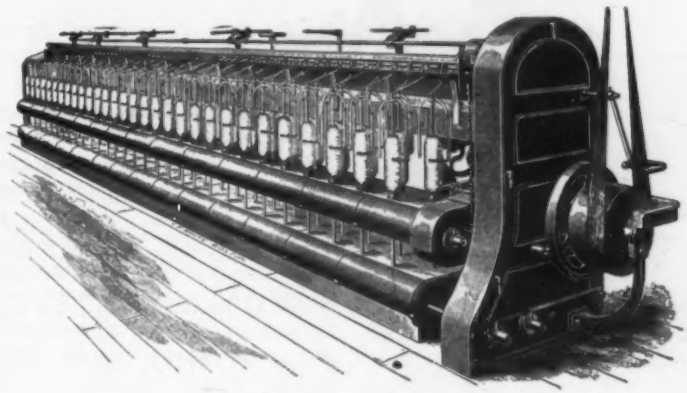
COTTON DEPARTMENT.

Improved Slubbing, Intermediate and Roving Frames.

We give herewith a description of the improved speeders now being turned out by the American Machine Co., of Pawtucket.

As most of our readers are no doubt aware, the plant of this company has but recently been completed. Their buildings are at Pawtucket, on the main line of the N. Y., N. H. & H. R. R. The main machine shop is 360 ft. long, 69 ft. wide, and is three stories high. The The building is brick throughout. The foundry is also 350 ft. long, and is built entirely of steel. Every modern improvement has been adopted in the erection of tnese works. The equipment of the shops is as near perfection as possible. All machines are of the latest and best models, and many of them built specially for this house. All of the large machines are set on solid granite foundations, thus insuring absolute rigidity, and consequent accuracy in the work. All parts of the different machines are made by special tools, and are exact duplicates, a fact which our practical mill managers will appreciate.

The new patent differential motion effects great saving in power, wear and tear, and gives more accurate winding, and consequently, evener and better work. The wheels of this motion, which are on the jack shaft, revolve in the same direction as the shaft, whilst in the old style differential the wheels revolve in the opposite direction to the shaft, and at a much greater speed than the shaft itself. A great deal of the power to drive the differential through the cone drums is done away with, and much more accurate winding is the result.



SLUBBING FRAME.

The swing or horsehead is very rigid, and has but one large carrier in place of two, as required by the old style differential.

The new arrangement of cone drums gives all the advantages of swinging cones, without any of their evils. Both ends of the cone are raised or lowered together from the front of the machine.

A patent locking device secures the cone after doffing, in its proper working

position, preventing all movement or vibration.

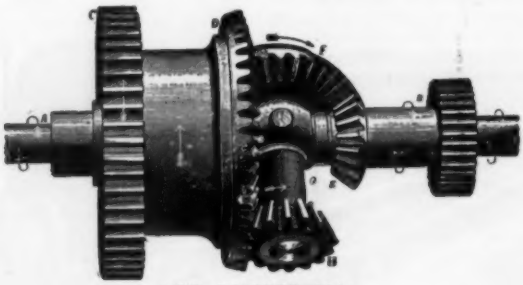
An improved method of tightening the cone belt does away with cutting, piecing, or taking-up. When slack, the belt may be tightened in a few moments by means of a quadrant bracket. Over five inches of stretch can be taken care of without re-piecing. A great amount of labor, stoppages and cone belting is saved.

The new system of balancing top or bobbin rail entirely prevents the long bolsters from tilting forward, even after many years of work, and relieves the slides from all friction and consequent wear, and prevents vibration of top rails, spindles and flyers, and bad work resulting therefrom.

Long bolsters are fastened by anim-proved method, which secures them firmly in position, and prevents them from working loose.

Frames have improved separate slides for each line of rolls, improved cap bars, polished iron top clearers, and decimal hank indicator, besides many other improvements.

Any further information regarding these machines, or picking, cards or drawing, will be gladly furnished by the American Machine Co.



NEW DIFFERENTIAL.

The new patent reversing or let-off motion entirely prevents the roving running over or under on the changes.

Bobbin and spindle shaft bearings and roller bearings are inlaid with brass.

Driving ends of bobbin and spindle shafts are case hardened, and are in short lengths, so that they can be easily taken out, even when frames are placed end to end, with narrow passages between them. This is a great convenience, as it prevents the necessity of having to remove a great many shaft gears. The shafts can be lifted out with the gears on them.

Recessed self-lubricating spindle feet are supplied with all frames, insuring constant lubrication, and preventing wear and danger from firing.

Cotton Carding.

For the Textile World.

The next process is the combing machine, and the comber having been discussed in previous issues, the double nip comber will be considered. The comber of this class, built by Dobson & Barlow, Bolton, England, has, after numerous experiments, become an assured success. It is made so that, by slight alterations, the single-nip comber may be changed into a double-nip; the only difference being the larger diameter of the cylinder; two segments and two sets of needles, and the nipper-stands, tins, etc. To allow for larger cylinder, and while the single-nip cams revolve once to one of the cylinder shaft, the double-nip cams are geared to make two revolutions to one of the cylinder shaft. The advantage claimed for the double-nip comber is an increased production; for while the single-nip comber may be run from 80 to 90

nips per minute, the double-nip may be run 120 nips per minute, and, while the former makes 80 to 90 revolutions of cylinder shaft, on the latter, the cylinder shaft makes but 60 revolutions, thus giving the needles on the double-nip a slower speed with an increased production. The settings vary but little from the settings for the single-nip comber described previously.

To set a double-nip comber: First set the detaching roller to segment to 21 gauge. Then set the segment 1¼ from detaching roller with the index at 5. Set the cushion plate to lip of nipper, to the thickness of a piece of writing paper. Next set the cushion plates, by means of the set screws that rest against the stands, to the 1¼ gauge; then place $\frac{5}{16}$ gauge between set screws and stand, and set nipper to segment to 19 gauge; when all the nippers are set, put the springs on at the back, then turn nipper cam until the rods are at the highest point; then again place $\frac{5}{16}$ gauge between the set screws and stand, and tighten the top nut on the rods until gauge is free, then tighten the bottom nuts.

Attention is next directed to the top combs, which are the chief instruments in controlling the waste. The setting of these depends largely upon the stock used and the percentage of waste to be taken out. For 1⅛ inch peeler cotton, set them to the 19 gauge, which would take out about 16 per cent. of waste. The next setting is the leather detaching rollers; these must be all set parallel with the segment and the steel detaching roller. To set them, turn the cam until the lifters are at their lowest point, then adjust the blocks on the lifters to the distance of the 21 gauge from the brass boxes on the end of the leather detaching rollers. Then set the brass clearing rollers parallel with the leather detaching rollers, the distance of the 18 gauge. The fluted rollers in the draw box must be set according to the stock used; that is, if 1⅛ inch stock is used, the rollers must be about $1\frac{9}{16}$ inches from centre to centre. The other settings are:

Clutch to close at . . .	4¼
Top comb down " . . .	4¾
" " up " . . .	9½
Back feed begins " . . .	4¾
Detaching roller comes forward at	6¾
" " on segment "	6¾
" " comes off segment at	8¼
Nipper closes at	8½

To get the draft of a double-nip comber:

¾ inch diameter of feed roller
38 gear on " "
— feed gear
5 star "
2 pins on cylinder shaft
60 gear on end cylinder shaft
57 stud gear to coiler
26 " " " "
18 gear on upright shaft
21 " " top upright shaft
18 " " end of calender roller
2 inch diameter of " "

Multiply the drivers together and multiply the drivens, leaving out the feed gear, and divide the larger by the smaller, which gives a dividend which may be divided by any feed gear, and give the draft for the same; thus:

$$\frac{\frac{3}{4}\times\text{feed gear}\times 2\times 57\times 18\times 18}{38\times 5\times 60\times 26\times 21\times 2}=449.38$$

Supposing it is wanted to put on a 16 gear; to find the draft divide 449.38 by 16=28.08 the draft with a 16 feed gear.

To obtain the percentage of waste taken out by the comber: Break the sliver off close to the calender rollers and break the waste off close to the combs; then put a board under the doffer to catch the waste. Start the comber and run about 30 nips, then stop and break off the sliver and waste, as before, keeping each separate. Weigh the waste, which will weigh, for example, 50 grains; then weigh the sliver, which, it is supposed, weighs 200 grains. Add the weight of the two together; thus: 50+200=250. Then divide the weight of the waste with two ciphers annexed by the total weight, 250 grains; thus: 5000÷250=20 per cent. waste taken out at the back of comber.

The Manufacture of Sewing Cotton.

The possibilities of producing regular yarns have been greatly increased in recent years by the improvements and developments in the mechanism employed, and the sewing cotton branch of the spinning industry, requiring as it does the greatest degree of strength, equality and freedom from irregularities in the yarn, has made corresponding progress. The manufacture of sewing cottons demands probably more accuracy both on the part of the technical man and the operative, than does any other class of yarn, notwithstanding which the literature of the subject is comparatively scanty.

The processes of manufacture are divided as follows:

1. Spinning single yarn.
2. Doubling.
3. Reeling or hanking.
4. Dyeing or bleaching.
5. Finishing.
6. Winding doubled yarn.
7. Winding on reels or in balls; coupled with reel making.
8. Labelling and packing.

Bobbin Spinning.—Impelled by the necessity of obtaining a carefully close-twisted double yarn, spinners are obliged to have recourse to giving the single yarns a preliminary twist before passing through the doubler, the yarns being spun in numbers corresponding to the double yarn it is desired to produce, and this operation requires to be performed with great care in order that the individual threads may be of equal twist, strength, etc., since otherwise uniformity of the finished yarn would not be complete. The necessary regulation of tension to guard against the formation of knots and knops is provided for in the accurate machinery now at the spinner's disposal. Owing to the fineness of the thread it must be paid out from the bobbins with ease, and on this account bobbin winders are preferable to flyer-throstles, since the spun yarn can be drawn so much the more loosely in proportion as its twist is increased by the radial motion in running off the bobbins. The speed generally employed is 63 to 87 in. per second.

Doubling. The twist imparted to the yarn varies with the kind of work for which it is intended; mostly in simple doubling it is the opposite of the spinning twist, but is sometimes carried out in the same direction as the latter. In order to give the greatest elasticity, regularity and strength to any number of thread, the spinner of doubled yarns determines empirical coefficients based on the relative cross-sectional values of the yarns, bearing in mind their compressibility (which increases with the number), and thus arrives at the proper angles of rotation, together with results for strength and elasticity. In any event the latter qualities in 2, 3, 4, 6 and 9-fold yarns do not bear direct relation to those of the individual threads, being influenced by the more or less favorable axial arrangement of the fibres. The machinery employed also differs in size and speed with the work it has to perform, the winders varying in size from 3¼ to 5 in., and the speed between 4500 and 10,000 revolutions per minute. From these dimensions and the twist required per running inch, the capacity per spindle per hour can be readily calculated either in length or weight.

The great improvements in ring spinning frames have resulted in a vastly increased productive power, and the facilities for oiling and cleaning the newer gravity, cork-cushion and other spindles, offer several advantages. The circumstance that the ring spindles give a slightly more decreased twist when the bobbins are empty than when full, exerts no unfavorable influence even on the finest sewing cottons. The difference in twist between very tightly twisted threads is 0.036 per cent., increasing to 1.27 per cent. in the case of very open yarns; but as this difference only means

0.228 of a turn with a 17.32 turns per inch yarn, the variation is so slight as to be undetected even with a magnifying glass. The greater portion of the 4, 6 and 9-fold doubles are twice doubled—*i. e.*, a 2 or 3-fold double is first twisted, and then two 2-folds are twisted together to make a 4-fold; two 3-folds to make a 6-fold; or three 3-folds to make a 9-fold yarn, a reversed twist being given in the last doubling. All double twisted sewing cottons are stronger, more supple and softer than single twist yarns of otherwise equal quality, and also produce a cleaner, flatter and softer stitch. In order to give them the same strength, etc., as the 4 and 6-fold cottons, the 3-folds (in particular) are often finished and glazed. Wet doubling is always employed for sewing cottons, as it enables the threads to be drawn flat and tight together, whereas dry doubling gives a looser and more porous yarn, with fluffy projections of fibre ends. In this branch doubling plays a part as important as carding in that of spinning, as failures therein can never be wholly eradicated or repaired; wherefore the utmost care, skill and knowledge are required on the part of the manufacturer.

Reeling or Hank Winding.—Since it has not hitherto been found possible to dye or bleach doubled yarns on the wooden bobbins, as is done with the more loosely wound yarns for spinning, they have first to be rewound into hanks or reels. This is effected carefully in the usual manner, but the crowns of the reels have to be made stronger than for spinning or weaving purposes, and must be arranged to throw out of gear promptly in case of a break in the yarn. It being necessary to protect the reeled yarn from loss of strength consequent on prolonged storage, it must be rapidly dried in a draught, but without much heat. For winding in chains the yarn is first wound on large bobbins and then transferred to chain frames, 4000 to 10,000 yds. being put into each chain according to fineness.

Dyeing or Bleaching.—This has to be adapted to the particular system of reeling or hanking practiced, and the task of so regulating the process as to secure the maximum effect of the colors employed, both as to the strength and regularity, while preserving the yarn as far as possible from becoming weakened by the dyeing or bleaching substances used, is one that will tax the powers of a good dyer; but apart from the special apparatus requisite for dyeing hanked yarns, and the difficulties connected with the manipulation of these goods, the general method is similar to that pursued with other classes of yarn. It only remains to add that grass bleaching is quite out of date, the improved mechanical appliances of the present day, when carefully used, producing better effects. Indeed, by the new bleaching process, the yarn is not only whitened, but improved in strength and elasticity. The "drying" has to be performed with great care by the employment of large volumes of fresh air at a moderate temperature, since too high a temperature prejudicially affects the yarn.

Finishing.—The sewing cottons most frequently glazed are, as has been said, the 3-fold, but 2-fold and the 9-fold doubles used by saddlers and shoemakers, are also finished in the same way. Great improvement has been made in the finishing machines, and it is found more economical to glaze from the hanks, as not only does the yarn attain the necessary softness quicker in this way, but larger quantities can be treated in a given time. The glacè finish has now been brought to such a high degree of perfection that cottons thus prepared can be used with advantage in machine sewing. Beam-to-beam or beam-to-spool machines are less used than those glazing from spool to spool, and since the latter work at a yarn speed of 0.11 yd. per second, and are mostly constructed to take 200 to 360 threads each, their daily capacity is very great and working expenses low, an active youth

being perfectly able to mind a machine. A thorough drying of the glazed yarn is essential before it is submitted to further processes of finishing.

Winding Doubled Yarn.—This is only necessary where the yarns are glazed in line. The machines are arranged so that each bobbin can be thrown out of gear if the yarn hangs, and, for the prevention of breakages, a differential motion is provided in order to maintain a regular tension throughout the winding. In the English machines this is very carefully worked out, and a speed of 2¼ to 2½ yds. per second is readily attainable without much danger of breaking even the finer threads should there be any clogging or hanging.

Winding on to Reels, and Making the Reels.—To prepare the finished cotton for sale it requires to be wound on reels or into balls of various sizes, according to the dimensions of the thread and the purposes for which it is intended. The length put into each varies between 50 and 1000 yds., the usual lengths required being 100, 150, 200, 300, 400, 500 and 1000 yds.; 4 and 6-fold thread is mostly made up in 200 and 500 yds. To ensure the regularity of winding essential to easy unwinding for use, the thread is passed over a guide grooved exactly to the size of the thread, and moving backwards and forwards with the utmost accuracy, so that the thread lies evenly on the reel without any waste of space between the turns. Of course the size of the guide groove and the speed at which it moves differ for each number, a thread of 0.03937 in. diameter requiring 25.4 turns of the reel for a 1 in. forward or backward movement of the guide. The earliest machines only wound one reel at a time, and required a girl to attend to each. These were supplanted by self-acting winders of a somewhat complicated construction, which economized space and labor but possessed several drawbacks, so that there has of late been a tendency to revert to simpler machines—still working automatically and with the greatest accuracy.

Owing to the great weight of wooden reels, amounting to from 30-45 per cent. of the finished product, frequent attempts have been made to employ a lighter reel, but only with partial success. The Keats* machine makes use of cardboard reels; but these, while suitable for short lengths (50-200 yds.), and, under certain contingencies, useful for export, can hardly be looked on as a perfect substitute for wooden reels. Knitting and crochet cottons are wound into balls by machines of another kind, obviating the necessity for the guide. The wood almost exclusively used for reels is birch, as it possesses in a high degree the necessary qualities of lightness and tenacity. Attempts have been made to substitute alder, but without much good resulting, this wood being more liable to tear in the lathe and to be more easily bent than birch. Small reels are turned from suitably sized cubes, but the larger are made from long blocks, bored, and rounded by rasps before being turned. High-speed lathes and polishers are employed, and skill is necessary to make the reels as small and light as possible.

Labeling and Packing.—These operations form the final stage of preparation for market. The labels are fixed at each end of the reel, one bearing the number and ply, and the other the length of the thread. Formerly the gum was moistened by the lips, and only young people were employed at the work, which is well known to be of an objectionable nature. This method has, however, almost entirely given place to mechanical damping, and in a few of the largest works the whole process is now effected by machinery. To-day, as thirty or forty years ago, sewing cottons are packed in dozens, and quarter and half gross, no better method having been as yet introduced. The rolls are wrapped in paper or cardboard, tightly bound with string, labeled and packed in boxes.

It is regrettable that owing to the greed of dealers, many of whom appear

to consider this industry as existing for their sole benefit, a considerable amount of deception is practiced in the retailing of sewing cottons, customers being deluded into purchasing reels containing from 15 to 25 yds., on account of their large size (which approximates to that of the 1000-yd. reels), compared with the low price asked, but it is to be hoped that this state of things is merely temporary. Undoubtedly, until a means of fastening cloth, etc., together superior to sewing has been invented, the manufacture of sewing cottons will still continue to employ many hands and enjoy a profitable existence.—[Leipziger Monatschrift für Textil-Industrie.

Japanese Hemp in California.

Experiments have been conducted at Bakersfield, Cal., for the past two years, which seem to demonstrate that Japanese hemp can be raised successfully there. A correspondent writes that it grows to the height of 15 feet in 90 days, and that two crops a year can be obtained. The fibre is pronounced of good quality, equalling the best Kentucky hemp, and the yield exceeds 4000 pounds of fibre per acre. It is prepared on the Fremery decorticator.

There are two jute mills in California, those in Oakland and those at the St. Quentin prison, which give a market for coarse hemp, such as is suitable for making sacks and other coarse fabrics for which jute is used at present, and at a price of 2 1-2 to 3 cents per pound. These two mills have a capacity of about 10,000,000 pounds annually.

The favorable outlook for this fibre and the successful experiments, have encouraged further cultivation, and about 100 acres are now being planted as a start in Kern county, and for the second crop a greatly increased acreage is expected. The coarse fibre will be sold in California, and the fine fibre will be shipped East or to Europe, according to present plans.

Sea Island Cotton.

The United States have never grown enough sea island cotton to supply the demand. Northern manufacturers buy all they can from the Southern states, and to make up the deficiency are forced to purchase the Egyptian long staple article. According to the reports of the Agricultural Department, the area of Florida suited to the cultivation of long staple cotton is greater than that of all the other sea island cotton growing states combined. With a view of increasing Florida's output, the Department has distributed 20 bushels of the best sea island seed that could be obtained.

Last year about 800 Florida farmers cultivated long staple cotton, and the coming season this number will receive a handsome increase. A large quantity of the seed mentioned has been distributed in what is known as the orange belt, as land that will produce fine oranges is usually well adapted for this purpose. The long staple yields from one-half to three-quarters as much cotton per acre as the short staple variety, and as it sells for three times as much, sufficient inducement exists to plant it in preference.

—At the sixth annual meeting of the Cotton Compress Men's Association of Texas, the members showed a commendable desire to accomplish reform in the matter of uniformity of size of bales. A great number of Texas ginners have disregarded the unwritten law that cotton bales should be 60 inches long by 30 wide, and the result has been marked irregularity in the size of the bales. This the compress men declare has worked against Texas cotton, and they strongly urge all ginners and compress men to take steps to overcome this objection. Circulars will be sent out to all ginners, and other measures will be taken to insure uniformity.

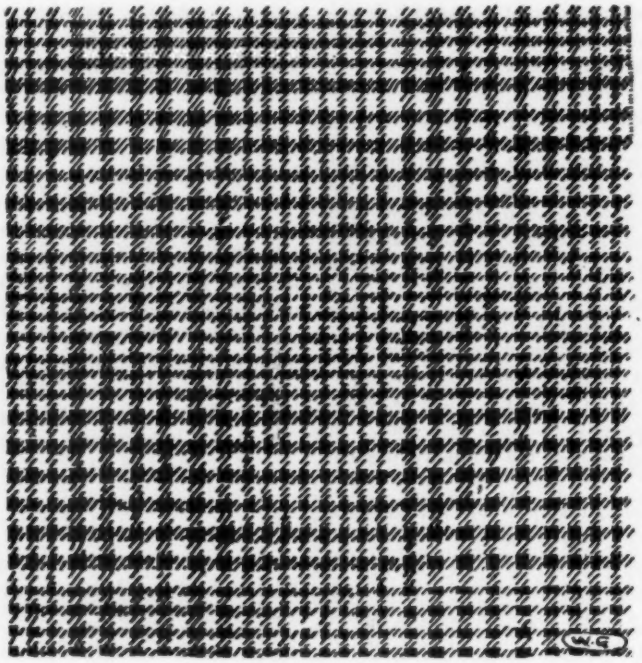
WOOLEN DEPARTMENT.

Plaids and Checks.

For the Textile World.

Not for a number of years has there been a season when the tendency towards pronounced patterns and large plaids has been so decided as the present one. For several seasons everything from the finest worsted to the cheapest cassimere has been made very neat in design, general effect and color, and now the long expected change has come and the market is in exceedingly bad state to give it a proper welcome.

All the stuff which is held in stocks is neat, and having been considered staple, producers kept on making goods, until with the accumulation of domestic goods and the importation of foreign fabrics, the market is glutted with neat effects. To cap the climax, the demand for large plaids and checks makes its appearance, and the manufacturer who produces these styles in the right fabric, cannot fail of doing a good light weight business.



No. 1.

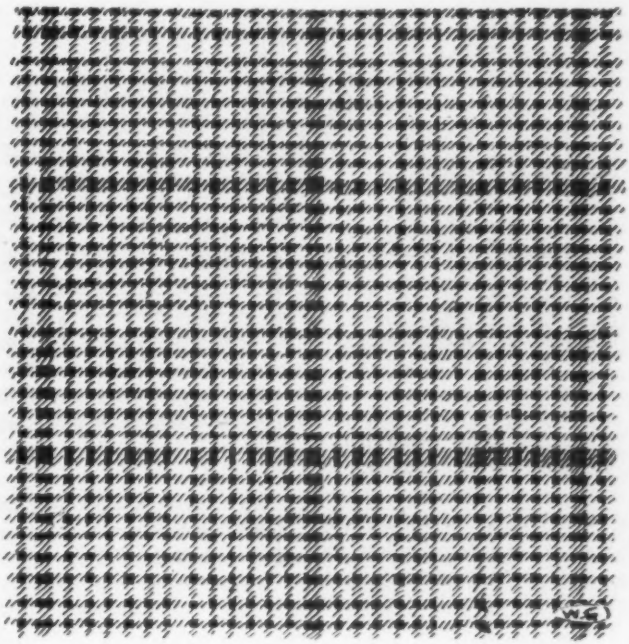
These large effects were made a year ago in a fabric which was full of kemp, by the Chester Co., and while these goods show a good sale, still it is doubtful if they will hold their own another season on account of the hairyness of

the stock. They are referred to here simply as the style of effects which will be in demand, but not quoted as a fabric to copy, as they have without doubt been worked for all they are worth, as the coarse cheviot stock is dropping out of place. What the trade demands is these large effects in an "all wool" fabric made out of good felting stock and with a melton finish, the fabric being well shrunk in the mill.

To give some idea of the character of the patterns, the accompanying figures

As it is impossible to reproduce the overplaid in the drawing, its position can be seen from the following dressing which for sake of uniformity with the drawing is given in black and white.

Dressing of warp.				Weaving of filling.			
4 ends	black	6 times		4 picks	black	6 times	
4 "	white			4 "	white		
3 "	black	4 times		3 "	black	4 times	
3 "	white			3 "	white		
1 "	red			1 "	red		
2 "	black			2 "	black		
3 "	white			3 "	white		
3 "	black	3 times		3 "	black	3 times	
3 "	white			3 "	white		
36 end =1 repeat.				96 picks=1 repeat.			



No. 2.

have been prepared. As it is impossible to reproduce them in anything except blacks and white, the general effect only can be obtained from the sketch. These styles are not intended to be reproduced in black and white yarn, but in blending colors, and in these a predominance of the browns and olives should be found.

Fig. 1 is a large plaid, which in turn is overplaided with a fancy color. This style should be woven on a regular four harness twill.

The changing of the colors in the dressing of warp and filling will do a great deal towards making an attractive line. The following are some of the changes which should be used:

In place of black, a rich dark brown combined with a light brown and a dark green overplaid is used.

For another sample in place of black

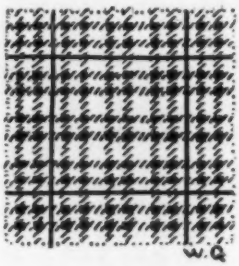
use the same dark brown, combined with a brown and green mix and overplaid with red.

For a fourth sample use a dark oxford with a light oxford mix, which is almost a white or a stain and overplaid with a bright blue or a red.

For a fifth change, use a light brown, with brown stain and overplaid with green.

A very striking and handsome effect can be obtained by using a black with a medium snuff brown, having a green overplaid in the warp crossed with a red in the filling.

These overplaidings need only consist of four colors, red, blue, green and orange, and should be put in, in single



No. 3.

ends, the end of color being heavy enough in count to show distinctly.

Fig. 2 is a reproduction of a ground work of small checks overplaided by two large checks of different colors, the effectiveness of this pattern depends almost entirely on the combination of the colors.

The dressing of warp and weaving is as follows:

Dres-ing.			Weaving.		
6 ends	white		6 picks	white	
3 "	black	6 times	3 "	black	6 times
3 "	white		3 "	white	
6 "	black		6 "	black	
3 "	white	6 times	3 "	white	6 times
3 "	black		3 "	black	
84 ends=1 repeat.			84 picks=1 repeat.		

By changing the colors of the dressings and a judicious combining of colors which blend, some very handsome effects can be produced.

Another style of pattern which will find favor, is that shown in Fig. 3, which consists of a small plaid overplaided with color.

Dressing of warp.			Weaving of filling.		
3 ends	white		3 picks	white	
2 "	red		2 "	red	
3 "	white		3 "	white	
4 "	black		4 "	black	
4 "	white	twice	4 "	white	twice
4 "	black		4 "	black	
8 "	white		8 "	white	
4 "	black		4 "	black	
4 "	white		4 "	white	
4 "	black		4 "	black	
60 ends=1 repeat.			60 picks=1 repeat.		

A very large variety of effects can be produced by using small checks as the ground works of the pattern and overplaiding with one, two and even three lines of color.

The dressing which follows will produce a very large plaid, and if in the right colors will undoubtedly sell.

Dressing warp.			Weaving filling.		
1 end	white	13	1 pick	white	13
1 "	black	times	1 "	black	times
1 "	white		1 "	white	
1 "	red		1 "	red	
1 "	white	3 times	1 "	white	3 times
1 "	black		1 "	black	
1 "	white		1 "	white	
1 "	red		1 "	red	
1 "	white	13	1 "	white	13
1 "	black	times	1 "	black	times
2 "	white	8 times	2 "	white	8 times
2 "	black		2 "	black	
94 ends=1 repeat.			94 picks=1 repeat.		

By changing the colors in this dressing and weaving to those which harmonize a very fine style can be produced.

On all these samples the nap should be left moderately long so as to produce an indistinct effect.

Kerseys.

DEMANDS OF THE CLOAKING TRADE.

For the Textile World.

Considerable difference of opinion has always existed between the cloaking and the clothing trade, as to the requirements of a piece of cloth. While the clothing trade has rejected fabrics, which in point of strength and quality of stock, excellency of finish and permanency of colors were not up to the high standard set by that trade, the cloaking trade has generally taken such goods, if

at all suitable to their wants. An outlet has thus been found for numerous pieces of kersey, which it was utterly impossible to crowd upon the clothier.

Kerseys have held a high position in the favor of cloak makers, and the present is apparently no exception to the rule of previous seasons. It seems, however, that this season there is a slight change in this respect, for the cloaking trade calls most emphatically for a high lustre. Quite a number of orders placed on low grade kerseys have recently been cancelled, and have been replaced with a fabric of considerable less intrinsic value, but having a very high lustre. Such action as this, upon the part of buyers, strongly indicates the drift of the trade, for this demand must be satisfied; and the finisher who is able to produce the best lustre upon low grade fabrics, is sure to be successful.

All the means of obtaining high lustre centre about steam, for while the water finish gives a certain amount of lustre, it is not permanent enough to be of value. The action of steam upon the wool fibre, has a tendency to bring out the inherent lustre of the fibre, but unless this is accompanied by a cooling process, most of the lustre which is obtained by the steam is lost again before the goods are completely finished. Not alone is much of the lustre lost, but unless the fabric is very strong, the goods will surely be tender. This is the great drawback in lustering low grade goods, for it is often found impossible to obtain the desired amount of lustre, without making the goods tender. Though the cleaking trade is not very particular on this point, few manufacturers care to put a piece of cloth upon the market which will not pass muster in this respect.

In steaming goods for a high lustre, especially on the new steaming machines now used for this purpose, it will often be found that one-half of the piece is strong enough, while the other half is tender. On investigation it is seen that the end which was next to the cylinder is the one that is tender. To overcome this difficulty, two ways are open; one is to return to the old practice of doing one piece at a time instead of two, three or four, as is generally done on the 18-inch cylinder machines, and reducing the time of steaming to the lowest limit consistent with the needed finish. The other way is to use more covering on the cylinders. Even on goods which should be amply strong enough, unless the cylinders are covered with a generous supply of burlap and cotton cloth, there are apt to be pieces which are tender, for two or more yards from the end. The goods being strong further in, would show that the action of the steam was a little too much for the first one or two folds, and if this amount is made up of burlap covering, the trouble will cease.

First, cover the cylinders properly. For an 18-inch cylinder, not less than 30 yards of burlap and 15 to 20 yards of cotton cloth should be used for covering. This, no doubt, will be deemed expensive, but if the strength of the goods is thereby maintained, it will more than pay for itself. One second made on account of tenderness, will eat up more than the cost of covering. When the cylinders are covered in good shape, one of the most frequent causes of tender ends has been guarded against, and it will be possible to give the goods a more thorough steaming. By running on one piece at a time, the actual time of the end being exposed to the action of the steam is reduced considerably, for it takes quite a while for steam to penetrate three or four pieces, and the time of steaming is not figured until the steam comes through evenly all over.

When the piece is wound on the roll good and tight, turn on the steam, and after it comes through evenly let it stay as long as possible, consistent with the strength of the goods. How long that should be can only be regulated by

actual tests. When running from one cylinder to the other, keep friction on tight and have the brush touch the goods pretty hard. After the piece is on the other cylinder, run it back once more and on again, so as to get a good brushing; for the action of the brush upon the wet fibre produces quite a lustre, which, with the action of the steam, will tend to produce a better lustre than can be secured without the brushing. The second steaming should be as thorough as the first, and the goods should then be rolled up tightly and left six or eight hours on the rolls, when they should be taken off and colored.

When they come back from the dye house and are speck dyed, they should again receive a good, strong brushing or wet gigging, after which operation they should be again rolled up tight and left over night, if convenient. All the lustre which it is possible to get has been obtained, and if the stock is at all susceptible of a lustre, the results of this treatment will be satisfactory.

Heavy Weights—Fabrics Offered.

For the Textile World.

The progressive manufacturer is always interested to know what his competitor has produced, and the price at which the leading fabrics have been offered. Some of the best selling goods have been made of the cheapest grades of stock, but in tasty effects.

The Chester Mfg. Co. had a line of black and blue worsted cheviots which were sold at $1 87 1-2 to $2.00 and all less 5 per cent. and 5 per cent.

Albion worsteds at $1.37 1-2.

Beoli worsteds in stripes and neat suiting effects at $2.37 1-2; frieze at $1.05.

The Atlas line of covert cloths sold by Mali & Co at $1.42 1-2.

Springville cassimeres at $1.87 1-2, and worsted piece dyes at $2.00 to $2.12 1-2 and $2.25.

The North Adams sold a line of twist cassimeres and worsted cheviots at $2.00 less 5 per cent.

Schaghticoke worsted cheviots, coarse stock for $1.30 and $1.50 and they also showed a line of melton cassimeres at $1.50.

The New England worsteds were $3.25 less 15 per cent. and a line of close face cassimeres at $1.37 1-2.

Phillips, Kunhardt and Allen, have the knack of showing novelties and novelties sell, the principal effects are coarse patterns in knickerbocker effects, these were sold at $1.25; a line of melton cassimeres were $1.50 and $1.75. The worsted cheviots in plain colors were $2.12 1-2. A line of worsteds were $2.50, less 5 per cent. and a fine frieze at $1.37 1-2.

The Silver Lake worsteds are a creditable line of trousering principally at $2.00, $2.20 and $2.25 all less 5 per cent

The Washington Mills Co., had a coarse worsted twill at 75 cents, one better at $1.00 and a still better one at $1.10. Piece dyed stripes in plain blacks, were $1.50 less 5 per cent. and $1.75 less 5 per cent.

The worsted mix twills were sold at $1.35. The kerseys were $1.00, $1.10, $1.25 and $1.50.

Wanskuck also produced a coarse worsted twill at 75 cents, piece dyed cheviot at 90 cents and a cassimere at $1.00.

The piece dyed stripes brought $1 50 less 5 per cent., this line also contained doeskin weave effects, and some suiting styles, with filling spots. A finer line of piece dyed stripes brought $1.75 less 5 per cent.

The Germania friezes were $1.20.

Dobson's kerseys at $1.00, the Norwalk kerseys sold by same firm at $2.50 less 5 per cent. and a line of all wool, small nub chinchillas at $1.10.

Holmes kerseys were sold at $1.90.

The Ehndale's sold by Stevens, Sanford & Handy brought $1.50 and $1.75.

The Lippitt Woolen Co. sold a line of worsted stripes at $1.60, another at $1.90 and a line of twist worsted diagonals at $2.12 1-2.

The Priestly worsteds brought $2.62 1-2 less 5 per cent.

The Sussex worsted cheviots in black, blue and brown, were $1.25.

Oswego fine worsted stripes at $2.00.

Broad Brook worsteds in suitings and stripes at $1.75 and $2.25.

W. J. Dickey & Co.'s kersey cassimeres at 70 less 7 per cent.

The Lebanon's, a line of mix goods, in melton finish, dark colors, made by Riverside Woolen Co., sold for 67 1-2 cents.

The Glendon cheviots were 90 cents, the Altons $1.00 and Claremonts the same price.

The Woodbrook worsteds were $1.35 and the Lyndale's $1.85.

The Hoosac worsted cheviots were $1.30 and the Glen Falls' $1.00 and $1.25.

The Hyde Park black, blue and brown cheviots were 75 cents.

The Central worsteds made by Farwell, sold for $1.62 1-2.

The Manchester cassimeres sold by Victor & Achelis, brought $1.32 1-2.

The Shannon worsted cheviots $1.50.

How to Change the Weight of a Fabric Without Influencing Its General Appearance.

From E. A. Posselt's "Textile Calculations," just published. Price $2.00. (Orders for books received at this office.)

Previously we mentioned "the less points of interlacing we find in a given number of threads the higher a texture (more threads per inch) we can use in the construction of a cloth." This will also apply to the use of a heavier count of yarn, or both items (higher texture and heavier yarn) at the same time. In the construction of a new fabric we are frequently required to produce a fabric of a given weight per yard; hence, after we find by rules given that the yarn we intend to use will, with its corresponding texture and weave, produce a cloth either too heavy or too light, we must carefully consider how to remedy this. In some instances the difference could be balanced by either laying the cloth wider or narrower in the reed, or shorter or longer at the dressing, and regulate the weight during the finishing process, *i. e.*, full the flannel to the required weight. By some fabrics (of an inferior grade) we might also regulate the weight to some extent during the fulling process (by adding more or less flocks) the latter of which will felt during the fulling to the back, and partly between both systems of threads the fabric is composed of. But in most fabrics a too heavy or too little fulling or additional flocking (according to the class of cloth) would reduce or destroy the beauty of its face, and thus decrease its value; hence we must regulate texture, weave, and counts of yarn to be used, to a certain extent, to suit the weight per yard of the finished fabric required. Most always the heavier a weight is wanted, the heavier a yarn we must use, and in turn suit texture to the latter. Again, the lighter in weight a cloth is required, the finer counts of yarn we must use, also with a proportional regulation of the texture. If the weight per yard in a given fabric is required to be changed (either increased or reduced) without altering the weave, or the width in reed, or length dressed (*i. e.*, want the new cloth to be fulled about the same amount as the given) we must alter the counts of the yarn in the process of spinning, producing a heavier yarn if a heavier cloth is wanted, and a lighter yarn if a lighter cloth is wanted.

Rule. The ratio between the required weight per yard squared and the given weight per yard squared, is in the same ratio as the counts of yarn in the given cloth are to the counts of yarn required for use in the new cloth.

Example. Suppose we are making the following cloth:

FIG. 26.
Weave $\frac{2}{2}$ twill.

Fancy Cassimere: 3240 ends in warp. 10 per cent. take-up during weaving. Weave given in Fig. 26. 72 inches width in loom. Warp and filling, 22-cut woolen yarn. Weight of flannel from loom, 17.2 oz.

Question. Find the proper counts of yarn to use if given weight, 17.2 oz., is to be changed to 19.1 oz.; *i. e.*, a flannel of 19.1 oz. is required (from loom).

Example. Prove previously given example for each texture; *a*, as to weight, and *b*, as to the proper construction according to rules given.

1. GIVEN CLOTH.

a. Ascertain given weight (17.2 oz.).

Fancy Cassimere: 3240 ends in warp. 10 per cent. take-up during weaving. Weave, $\frac{2}{2}$ 4-harness twill. 72 inches width in loom. 48 picks per inch. Warp and filling, 22-cut woolen yarn. 3240 ends in warp. 10 per cent. take-up. How many yards dressed?

100:90::x:3240 and 324,000÷90=3600 yards of warp required dressed per yard of cloth woven.

22-cut=300×22=6600 yards per lb.÷16=412½ yards per oz.; hence—

3600÷412.5=8.8 oz. weight of warp.

72×48=3456 yards of filling required per yard.

3456÷412.5=8.4 oz., weight of filling.

Warp,	8.8 oz.
Filling,	8.4 oz.

Answer. 17.2 oz., total weight per yard from loom.

b. Proof of Proper Structure of Given Cloth.

22-cut=6600 yards per lb. and $\sqrt{6600}$, less 16 per cent.=68¼ threads of 22-cut yarn will lie side by side in one inch.

$\frac{2}{2}$ twill=2 points of interlacings in one repeat of the weave.

Thus:

$\frac{68\frac{1}{4}\times 4}{4+2}=68\frac{1}{4}\times 4=273\div 6=45\frac{1}{2}$, or practically:

Answer. 45 warp threads per inch should be used, and this is the number of ends used, since—

3240 (threads in full warp)÷72 (width of cloth)=45 (ends per inch).

2. REQUIRED CLOTH.

b. Find Proper Texture for Warp.

18-cut woolen yarn to be used=18×300=5400 yards per lb., $\sqrt{5400}$=73.49, less 16 per cent. (11.74)=61¾ threads of 18-cut woolen yarn will lie side by side in one inch.

4-harness twill contains 2 points of intersections in one repeat.

$\frac{61\frac{3}{4}\times 4}{4+2}=247\div 6=41\frac{1}{6}$, or practically:

Answer. 41 threads per inch must be used.

a. Ascertain Weight for Required Cloth.

Using the same width in reed as in the given cloth (72 inches).

41×72=2952 ends must be used (10 per cent. take-up).

100:90::x:2952 and 295,200÷90=3280 yards warp required for one yard cloth from loom.

18-cut yarn=5400 yards per lb.÷16=337½ yards, per oz.

3280÷337.5=9.7 oz. warp yarn required.

44×72=3168 yards filling required, and 3168÷337.5=9.4 oz., filling required.

Warp,	9.7 oz.
Filling,	9.4 oz.

Answer. 19.1 oz., total weight per yard from loom, being exactly the weight wanted.

Memo. In calculating weight for both fabrics we used three additional picks compared to the warp threads, which is done to illustrate practically the softer twist of the filling compared to the warp yarn (and which item has already previously been referred to). In the calculations we only use approximately the decimal fraction of tenth, since example refers only to illustrate

the procedure. In examples we exclude any reference to selvage.

Example. The following cloth we are making: Worsted Suiting. 3840 ends in warp, 8 per cent. take-up, 60 inches width in loom, warp and filling 2/32s worsted, weight of flannel from loom, 14.6 oz. For weave, see Fig. 27. (No reference taken of selvage.)

Question. Find the proper yarn to use if given weight, 14.6 oz., must be changed to 16.3 oz. (from loom); *i. e.*, a flannel of 16.3 oz. is wanted (exclusive of selvage).

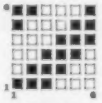


FIG. 27.
Weave $\frac{2}{2}$
6-harness twill.

$16.3^2 : 14.6^2 :: 16 : x$

$(16.3 \times 16.3) : (14.6 \times 14.6) :: 16 : x$

$265.69 : 213.16 :: 16 : x$

$213.16 \times 16 = 3410.56 \div 265.69 = 12.9$

Answer. 1/13s or 2/26s worsted yarn is required.

(Continued in next month.)

The Pattern Room.

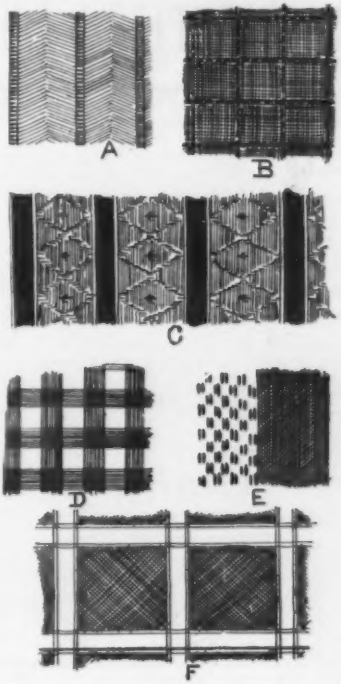
Most any designer can get out a fairly good pattern if he is given opportunity to utilize costly yarns and introduce complicated and difficult effects, but it is another thing to make salable designs with the means at hand, and profitably.

The writer was once employed as an assistant in a pattern weaving room of a fancy goods mill. There were three pattern looms in the room, one of which was a Thomas type, in which forty harnesses could be worked, and in which the chain was of the button pattern, so that the raisers and sinkers could be altered readily without taking off the chain. The other looms were of the ordinary pattern weaving kinds.

The designer of the mill was a genius, but he was not practical. The warps were made about twenty inches wide and ten yards long. There were different patterns in each section of the warp.

In each section, the ground work was liberally distributed with fancy yarns, and after having woven a pattern about ten inches long, the designer would have these fancy yarns broken out and others substituted. The result was that a very large variety of patterns were produced, differing in the main only in the style of the fancy yarns.

These patterns were sent to the commission houses and a batch selected. Then the complications began, for the orders would call for many small warps, each differing in the arrangement of the fancy threads, so that the mill was compelled to make short warps, resulting in waste of yarns, loss of much time, and proved a costly experiment all around. Yet the patterns were all right, as far



as the designs were concerned. But the mill changed designers.

The new man began work on another principle, which consisted in effecting variations by altering the harness chain or the drawing-in arrangement. He would form a warp in which the greatest possible changes could be made without taking it out of the loom for redrawing; his aim was to get plenty of filling changes (for these can be made at a small cost), and the result was that the goods sold as well, were as well liked by the commission people, and they could be made at a profit.

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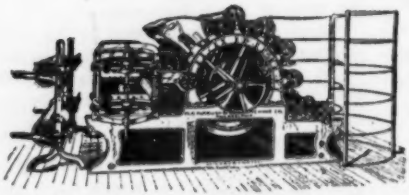

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Some designs made by this man are given in the views, in which *A* is a sample woven with a right twist filling on a warp made from twenty threads of right and twenty of left twist, with a rib between. By varying the twists, the colors and the drawing-in, many effects are possible, as are also in the warp *B*, which is a similar arrangement with single twist yarns checked off as shown.

Sample *C* is made with black stripes intersected with a diamond effect, a variation being possible by omitting the diamond weave, substituting a plain and checking with black, same as the warp.

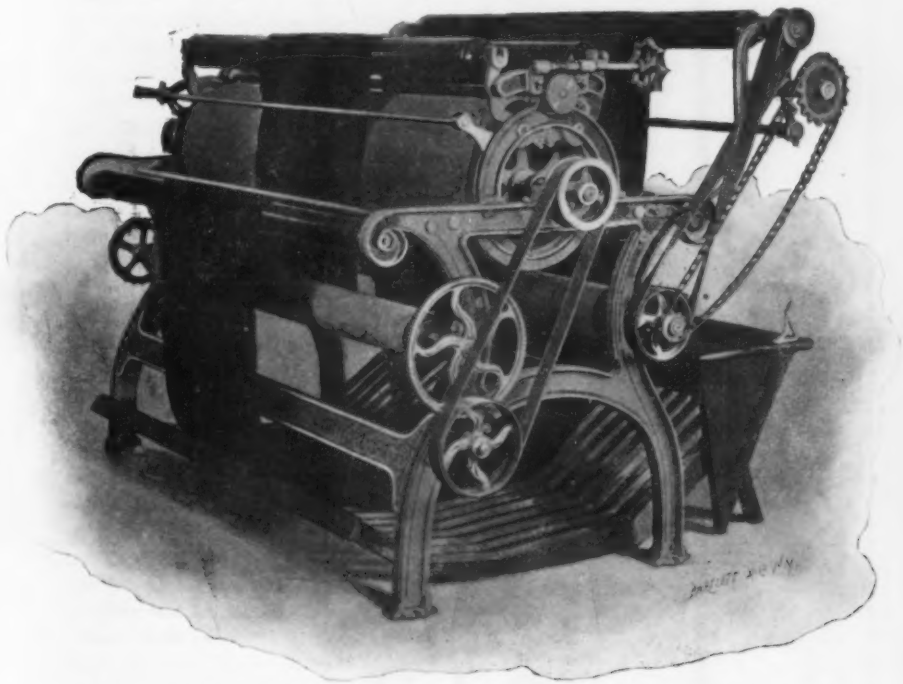
D is a plain check pattern, while *E* is a basket effect combined with a fine diagonal, being varied with colors and by checking with the filling.

F is quite a prominent pattern, and is varied by altering the weave from plain to twill, or to diagonal, etc. By making up a few warps with such patterns, a large variety of very attractive and possibly selling designs are practicable.

In finishing patterns, it is safer to follow them up to the end. Do not let the fuller attach them to an ordinary piece and run them that way. Good patterns are frequently made to bleed through excessive fulling. A number of patterns require close attention to finish right. After finishing, cut out with square steel disks, or better still with a regular pattern cutter which will cut any size, and mark each with number.

A New Sanding Machine for Worsted Manufacturers.

The cut herewith represents a new sanding machine just put on the market by the Parks & Woolson Machine Co., of Springfield, Vt.



Nearly every worsted manufacturer uses sand rolls, and this machine, which is sold at a very low figure, will meet a requirement that has been long neglected. It is tastefully built, and is strong and simple in all its arrangements. For anyone wishing a greater capacity, they are built with two cylinders instead of one. The cylinders are 16 inches in diameter, and there are two applications of the cloth to each cylinder. Every machine has a folding attachment. For further particulars address the above firm.

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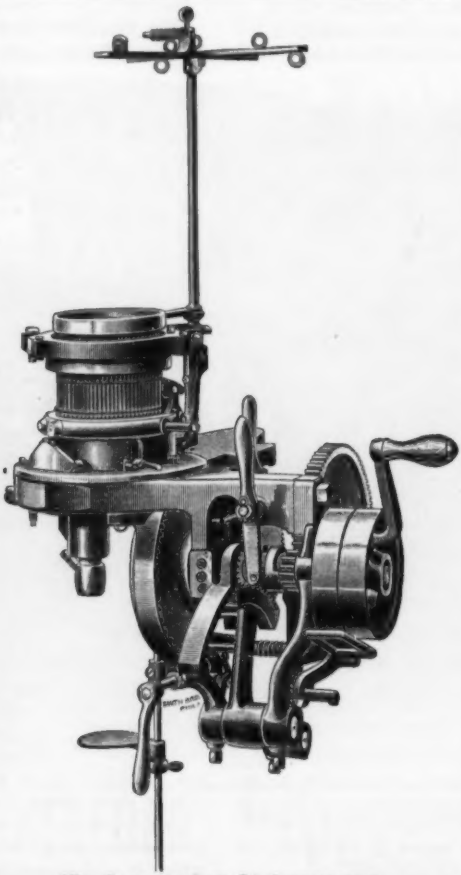

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KNITTING DEPARTMENT.

The Knit Goods Situation.

Not all of the improvement expected for April has materialized, still the condition of the underwear trade is better than at the beginning of the month. Neither the number of the orders nor their alacrity in arriving, have been up to the desires of the parties most deeply interested.

It would seem as if white ribbed cotton goods were rather leading the market at this time. Novelties move slowly, and it is a bad season for anything except the regular staple lines. A medium quality, low-priced garment of good value can always be sold, as goods of this description suit the tastes and pockets of the masses who consume ninety per cent. of the underwear used in the United States.

While it is yet too early to form a definite opinion as to the quantity of light weight underwear which will be required to finish the seasons, the indications are that, under normal weather conditions, the trade will be able to handle every dozen the manufacturers can produce. Lisle thread underwear for July and August use, shows an increased demand over last year, and the same remark is true of fancy balbriggan underwear.

During the first week in May there was a slight improvement in the imported hosiery business, prices being fairly steady, with less of the feverish anxiety to unload large parcels at cut figures. The demand for golf and bicycle hose keeps up remarkably well, and there is no doubt of this being the largest season on record. This was a natural result of the widespread development of the use of the bicycle, and of athletic sports generally. The bicycle craze and the golf fad have been of exceptional benefit to the fancy knit goods and woolen hosiery business. If the profits on these goods are not satisfactory this season, manufacturers will have only themselves to blame.

Hosiery manufacturess should be immensely gratified at the continuous and substantial growth of the business in American full-fashioned hosiery. The production has come to stay, in spite of the competition of European goods, and this class of goods is likely to form no small part of the hosiery business of this country in the future.

Running Flat Rib Frames.

There are few knitting frames that are easier to work when once right than flat rib frames and few that are harder to get right when once wrong. They are often abused by being placed in the charge of inexperienced men; the overseer may think that because the frame is running right just then, it will always run right. Having had some little experience with this class of frames I will try and mention a few of the difficulties which the workman has to face.

Suppose that we have been engaged to run a four division flat rib spring needle frame making sleeves for ladies' ribbed shirts. The machine is apparently all right and we start off to make our first set from 2/40s cotton. We have only run a few inches when we notice that the work on one of the divisions is somewhat shorter than the other three.

First of all we examine the carrier needles and thread guides to see if any burrs or waste have got in. If not, we then examine the slurcocks of the various divisions to see that they all push

the jacks down with equal force, and find that the slurcock of that particular division that is running shorter than the rest is not so hard on as the others and consequently does not push the jacks down so well, which makes it shorter.

To remedy this we strengthen the spring which pushes down the bolt of the slurcock until it exerts an equal pressure on the jacks with the other divisions. If this fails to remedy the irregularity, then the thread guides should be carefully examined to see if there is a rough place in the same over which the thread has to pass and if so we proceed at once to smooth it. Generally one of the three things above mentioned will effect a cure.

Scarcely have we got over that trouble when a new one confronts us in the shape of a dropped stitch every few courses. These dropped stitches are in a vertical line and we examine the corresponding needles to see if they are worn or down in the eye; if so, replace them. Failing in this, we look at the sinker and find that it has a nick in it which has probably been caused by a broken needle at some time or other. This nick should be taken out at once by means of a piece of very fine emery cloth. Knitters should be very careful of these dropped stitches, for they are a sore trial to the mender, and if they occur frequently, quite spoil what might otherwise be a very desirable garment.

Should the lines of dropped stitches be horizontal instead of vertical, and should they be spread over the fabric, it is due to the machine needles not being set sufficiently deep to cover the last loop before the presser is at work. These may seem little things, but they are the points that tell in the value of the goods.

After this is remedied, we notice that the selvages of the work are very unsightly, the outside loop being thrown off the needle altogether, occasionally. This is probably due to the late action of the snappers which take up the thread at the end of each course, and which allows the outside sinkers to take a larger loop than what they should, sometimes causing the loop to be dropped off the needles altogether, and at other times leaving it so slack as to quite spoil the looks of the seam when it is done. By making them take up the thread earlier, it makes the loop tighter and shorter, and makes a very even selvage, providing it is not made too early, when it will cut and mispress on the selvage. The great point about the snappers is to have them take up the thread the instant the last jack is drawn. On some frames, instead of snappers, tension rings are used, but these are not so satisfactory, as the tension is on during the whole course as much as at the end, and in the case of tender yarns this increases the liability of cuts.

The selvage may be also tightened or loosened by decreasing or increasing the lead which is allowed the carrier over the sinkers. As an aid to keeping the selvages on the needles, it is often found best to have an extra machine needle without a beard on both sides of the divisions, this needle being allowed to stand a trifle higher than the regular needles.

"Cuts" are the next thing to demand our attention, and here let me point out that a cut on a rib frame is a more serious thing than it is on a plain frame. On the latter frame the fabric may be pressed off and run on again without spoiling the fabric, but not so on a rib frame; once spoiled it is entirely wasted.

The most prolific source of cuts is inferior yarn and bad winding. The yarn may be full of burrs and shives, and in running off the spools the thread will catch against them and cause the jacks to fall unevenly, so that when locking up, the sinkers will cut the tight loop through, and leave a hole in the fabric. Cheap yarn is all very well in its place, but cheapness in this direction is usually a "penny wise, pound foolish" policy, which injures the manu-

facturer and ruins the reputation of his workman for producing good work. The knitter cannot make good work out of bad yarn any more than you can make "a silk purse out of a sow's ear."

Even the best of yarn is often rendered unworkable by bad winding. Large knots, pieces of waste and accumulations of lint are allowed to go on the spool, and when they reach the knitter instantly bring him to grief. After twenty years' experience in knitting mills in England and America, I have come to the conclusion that more than one-half the waste and damaged goods could be prevented by proper attention to the raw material and its winding. I am aware that I shall be told that in these days it is necessary to economize, but where is the economy in saving a cent per pound on yarn, and spoiling dollar after dollars worth of fabric, as well as injuring your machinery and breaking needles. These truths may not be palatable, but they are well known to every practical knitter of fine goods. But some one will ask what has this to do with rib frames. I answer, everything, for the foundation of rib knitting is the same as plain knitting, viz., good raw material properly wound. ONE WHO KNITS.

(To be continued.)

Knit Underwear from the Retailers' Standpoint.

Wishing to get the opinion of those who come most closely in touch with the great purchasing public, the large Boston jobbing house of Brown, Durrell & Co. has recently written to a number of well established retail houses, asking for criticisms and suggestions on certain points. Such expressions of opinions cannot fail to be beneficial alike to the manufacturer, jobber and retailer. The questions were submitted in the following form:

I. What do you consider the most serious defects in knit underwear to-day?

II. Is the demand for all wool underwear of a medium weight increasing?

III. Can you suggest any improvement in sizing or boxing both summer and winter grades of knit underwear?

A member of the firm, who had been a retail buyer of knit underwear for many years, gives his own opinions as follows:

In my opinion the most serious defect in knit underwear to-day is the lack of proportion in which many garments are cut. In Jersey goods the tendency at one time was to knit on two or three machines the whole five sizes that went into the retailers' stock, relying upon the elasticity of the garment and the ignorance of the consumer, to cover the deceit. This is being remedied more and more as the consumer insists upon having a garment which shall fit. Particularly, however, does this criticism apply to almost every line of children's underwear. It will be found that shirts and drawers designed for children, especially children from four to ten years, are, in almost every case, entirely out of the true proportion, and so conspicuously so, that the writer many times has heard this remark from the consumer: "I should know from the looks of the garment that it was designed by a man, and evidently one who had no children of his own." Be this as it may, it is almost impossible to go into any retail establishment and find an ordinary flat vest of the right proportions for a child of three or four years.

The same is true of the drawers. They are made long and narrow instead of wide and short. They seem to be built upon a certain scale of sizes which goes ahead on the system of measurements, entirely irrespective of the fact that the child grows in different proportion between the ages of three and six than at any other time in his life. The consequence is that three-quarters of the children's underwear bought today has to be made over at home before it is suited to the needs of the child. The manufacturer who is acute enough to sense this fact, and place upon the

market a garment, which, perhaps, may not be as elegantly proportioned from an artistic point of view as those now seen, but which fits the subject for whom it was intended—such a man has before him the possibilities of a large sale of his product, and also the satisfaction of introducing a much needed reform.

Taking up question II., it has been our experience that the demand for medium weight underwear is largely increasing, both on the part of men and women. The tendency of business to-day is more towards indoor work, where the lighter grades of underwear alone are necessary, and with this increased tendency comes a larger demand for medium weight goods. In certain localities all wool underwear of light and medium grades is in demand the year round, but we are of the opinion that as yet New England has not been sufficiently educated up to the sanitary and hygienic idea to make possible a large demand for light weight wool underwear at all seasons of the year.

Question III. Sizing and boxing are two vital points in a knit underwear business. The sale of many a garment has been greatly handicapped by its being put up in an inferior package. The tendency to-day is more and more to devote time and expense to the design and construction of the package which contains merchandise. Knit underwear which is put out in cheap, poorly made boxes, is at once stamped by both the retailer and consumer as cheap, whether this be the fact or not. On the other hand, many an inferior article has had a large and extended sale, simply because it was put up in an attractive and popular package. We can remember when nothing but the high grades of underwear, such as retailed for $1.25 and $1.50, were put up in 2-12 boxes. To-day one can buy all grades, except the cheapest, put up in this form, and its popularity attests the wisdom of the course. Every retailer throughout the length and breadth of this land, no matter whether his business be among the thousands or the millions, appreciates the receipt of a line of goods put up in strong, substantial boxes, neatly labelled, which are an attractive addition to the shelves of his department, and which render unnecessary an apology before the goods are shown to the customer.

We give space to a number of the letters received in answer to the questions sent out, as they are full of pertinent and practical suggestions:

WOODWARD & LOTHROP, WASHINGTON, D. C.

I. We find that size 3 is of no use, as it is too small for ladies, and is not suitable for misses.

II. No; if anything, decreasing.

III. The quality of the board from which boxes are made might be improved.

* * *

SHEPARD & CO., PROVIDENCE, R. I.

I. The burrs, or small sticks, that cause the irritation complained of by so many, who think they cannot, on this account, wear woolen underwear.

II. No, not with us. We find tendency rather the other way. We think that 80 per cent. wool, sold as 80 per cent., is nearer what the large majority prefer.

III. In our judgment it is a mistake to make 2-12 dozen boxes the common short length, whereby the underwear has to be folded twice. They should be made the same length as 6-12 dozen boxes, as a matter of economy of room. Children's pantalets, in small sizes, should be made with larger waists, nothing smaller than 20, but same as at present in length. More attention should be given to underwear in popular grades for tall, slim, and short, stout men.

* * *

H. C. ANTHONY, DECATUR, ILL.

I. Sleeves in underwear are entirely too short for this Western trade. Make the arm holes larger.

II. No. Great increase for fleeced; very little demand for all wool, in any weight.

III. I would suggest for winter weights, 2-12 dozen in a box; summer, 6-12. Like underwear sized up to Nos. 6 and 7.

* * *

D. H. SCOFIELD & SON, PHILADELPHIA, PA.

I. The greatest defect, in our opinion, is the fleecing of the surface of cotton and part wool underwear, thereby imparting fictitious weight and value to the garments, and injuring the service of the fabric. It is a great injustice to consumers, and should be discontinued by manufacturers. We hope the time will soon come when jobbers and retailers will refuse to buy this garbled stuff.

II. The number of wearers of all wool un-

derwear the year round is increasing, which naturally improves the demand for the medium and light weights for spring and summer.

III. We think if shirts were sized by a small cloth tag at the neck, instead of being indistinctly stamped on the skirt, it would be a decided improvement. Also the drawers in a similar manner, at the waistband. This would save much disarrangement of stock in looking for sizes, and would also be of value in the condensation of stock towards the close of a season. The printing of a full schedule of sizes on the labels of boxes would also be a convenience.

* * *

M. E. RICE, CHELSEA, MASS.

I. The most serious defect is in boys' underwear, which is the shape of the drawers. They are mostly short bodies and long legs, while they should be long bodies and short legs. They seem to be made without any regard to the "fitness of things." All makes of underwear should measure as marked.

II. No. The demand for *cotton and wool* in the medium weights *is* increasing.

III. Uniformity in boxing is very desirable. All medium and heavy weight goods, to retail at over 50 cents each, should be packed in 2-12 boxes, while the summer weights should be packed a dozen in a box.

* * *

FOWLER, DICK & WALKER, EVANSVILLE, IND.

I. The proportion of sleeve to the size of the garment, and usual adjustment and finish of same.

II. All wool underwear, flat goods, show increased demand in medium and better grades.

III. Moderate and the better grades, it is always worth the cost to put up in 2-12 boxes.

* * *

HARNED, BERGNER & VON MAUR, PEORIA, ILL.

I. No answer.

II. No, we think not. The fleeced cotton goods in the various kinds are diminishing the sales of all kinds of woolen underwear.

III. Manufacturers should adopt a scale of measurements for the various sizes of all kinds of underwear, which should be known to both merchants and consumers. Less returning and exchanging, and more satisfactory merchandising would be the result. Winter goods above $6 per dozen should be in 2-12 dozen boxes.

* * *

J. R. LIBBY, PORTLAND, ME.

I. Larger opening to the vest would enable the wearer to get her head through without disarranging her hair. Put the ribbon on the top edge of the vest itself, instead of through the opening of the silk edge.

II. No.

III. No; except, perhaps, heavier box material, so that when goods are shipped in bundles—small orders for matching up—the boxes will not look as though a full grown Bengal tiger had been cutting his teeth upon them.

* * *

A. LISNER, WASHINGTON, D. C.

I. In flat underwear, vests should be made with more slope in the waist line, and a little more shapely in the sleeves.

II. The sale of medium weight all wool is increasing over the heavier weight, but I do not think all wool garments are so much sold as formerly, on account of shrinkage, especially in the ribbed goods.

III. In ladies ribbed wool underwear it hardly pays to get size 3, unless they are cut fuller than a great many have been in the habit of making. I would that some manufacturers put their goods in boxes that are stronger and better made than those they have been using.

Knit Goods Novelties.

The field covered by knit goods enlarges each year. Some of the latest types of goods to be introduced along this line are illustrated in the view in which several styles of foot gear are shown. These articles are for cycle uses. The one marked *A* is a ladies' boot, the sole, heel, part of the upper, and the section on which the buttons are fastened being of ordinary leather stock, while the figured part is knit. The object of making a shoe of this character is to obtain not only novelty of design, softness and pliability, but to secure a porous covering for the foot which shall reach above the ankle. The common leather or kid shoes are heating, unless low cut, and are therefore objectionable to the rider in warm weather. The process of making the knit part of the shoe is readily performed on any automatic machine which is supplied with a pattern chain and jacquard attachment for throwing the heels of the design needles into position at the proper time. A ground work of some drab or grey color, with the figures floated in a bright color of some shade, develops a good design. Owing to the more severe strain and wear to which the ordinary male cycle rider puts his foot gear, it has been found necessary to use more leather stock in men's shoes. A sample of one is given in *B*, in which it may be seen

that only the upper parts of the sides are knit material. But the expanse covered by the knit texture is of sufficient proportions to answer the purposes of ventilation, and a comfortable shoe results.

The rider can obtain great ventilation by wearing low cut shoes, but these are so loosely adjusted to the foot that they do not ride as easily as a shoe which is laced or buttoned over the ankle. In making the knit part of shoe *B*, a blocking attachment is needed on the machine, two or three styles of which

NOVELTIES IN KNIT GOODS.

attachments have been successfully introduced lately. The imitation of line work is made by throwing a dark backing to the face, on the same principle which is employed in producing the blocks. Where the dark work used in the blocking and lining is not on the face, it is on the back, the texture being practically double.

Some riders prefer a low shoe, regardless of other conditions, and the knit goods manufacturer who would undertake to meet with the rapidly increasing demand for these goods, would find it necessary to keep the low types in stock. A shoe of this sort is exhibited in the sample, *F*, all of which, except the sole, heel and lace parts, is knit. Varied figured effects are possible, the one shown in this specimen being developed with a dark ground and a series of floral designs thrown to the front by the use of the regular pattern chain on the automatic machine.

Various lines of leggins would also be included in work of this nature. In fact, the field that is developing for knit goods manufacturers in the bicycle suiting and foot wear line is almost boundless. The writer lately met a New Hampshire knit goods manufacturer, who, after struggling to keep his mill going the past few years, has had to start in running overtime to supply orders for a peculiar shaped glove affair, which he has devised for cyclists to attach to the handle bars of the machine, in such way that a pocket is formed which covers the hands and wrists of the rider, affording protection from rain, cold, etc. Others are planning new cycle shirts, stockings, jackets, etc.

The style marked *C*, of the leggins shown herewith, is made on a blocking attachment, while the diamond pattern in *D* is developed on an automatic knitter furnished with a set of wing cams which may be adjusted to bring into action those needles required to work the design, something after the plan of the zig-zag regular adjustment. In forming the fabrical portion of the parts required in making the shoes and the leggins, a plan something like that demonstrated in *H* is followed. The shape can be produced on a flat machine complete, or the shape can be cut from straight web. The pattern is practically a one-piece cut formed of the toe part, instep, back and sides, each part of which can be regulated to conform to the needs of the article into which it

is to be made. Among other novelties is the style of leggin shown in *E*, which is knit flat, with soft leather binding at top, bottom, and at the junctures where the buttons go. The design calls for the employment of the ordinary automatic change blocker and swing cam movement, with '95 attachments; or if knit on common machine, the floral decorations can be seamed on after the garment is knit.

In making any of the above types of goods for cycle users, two essential points are to be held in view; 1, the yarns must be firm and strong, and 2, the texture must be non-stretching and extra substantial. These ends are attained by using a long, elastic, rather coarse and healthy fibre. It will not do to put over ten per cent. of shoddy stock, or an equal amount of cotton in the mix. The texture for the shoes can be made non-stretching and durable enough by plenty of fulling, but it of course will not be advisable to full the leggin stock very much. A close stitch and a firm setting of the texture at the machine has been found to be the best, thus avoiding the necessity of excessive fulling to close up the meshes. As foot wear is subjected to considerable exposure, the need of good colors is evident to preserve the designs. Aside from extra care in mixing the stock, closer knitting, additional fulling and good colors, the other processes of preparing the goods for the market are nearly similar to regular sorts.

BOSS KNITTER.

Preparing Wool for Underwear.

The Scientific American has lately described a unique method of preparing wool for underwear. The pure, unsulphured, undyed wool is soaked in an extract made with spirits of ramie from the bark taken from the stem and roots of the Daphne Mezereum, a tree grown in the northern regions of Europe. The wool, with the fibres loosened as much as possible, is kept in this extract at a temperature of 35° Reaumur for three hours. It is asserted that wool thus treated remains generally odorless and possesses an unsurpassable suppleness and softness, as well as a peculiar absorptive activity on the humors and perspiration of the body.

Paper Hosiery Moulds.

In making hosiery moulds from paper, the parts pass through a tank containing the cementing solutions which impregnate the paper. The thicknesses are permitted to dry a few days, when the whole are run through a solution of oily matter that soaks into the fibre. Then another partial drying occurs, after which comes pressing, during which operation the three-quarter thickness is compressed to less than a half inch, or to required proportions. Now the forms are sawed out, edges sandpapered, a coating of waterproof paint put on, and the forms are ready for use. They are much lighter and cheaper than wood. A second style is made from pure cellulose that has first been treated to a bath of caustic soda and afterwards acted upon with carbon bisulphide. This is dissolved in water, an insoluble coagulated mass is procured, and the latter, when separated from the water drys out into a hard, compact form. This same substance has been procured in a slightly different form for use in making tool handles and buttons. The operation of getting this material into shapes for hosiery boards is accomplished by cutting the forms from the dried sheets, smoothing, polishing, staining, etc., is done in ordinary way. [Paper Mill.

A New Machine for Knitting Heavy Socks and Mittens.

The illustration shows a view of a new machine, which is the invention of Clark Older of Portage, Wis., and for which letters-patent have recently been granted.

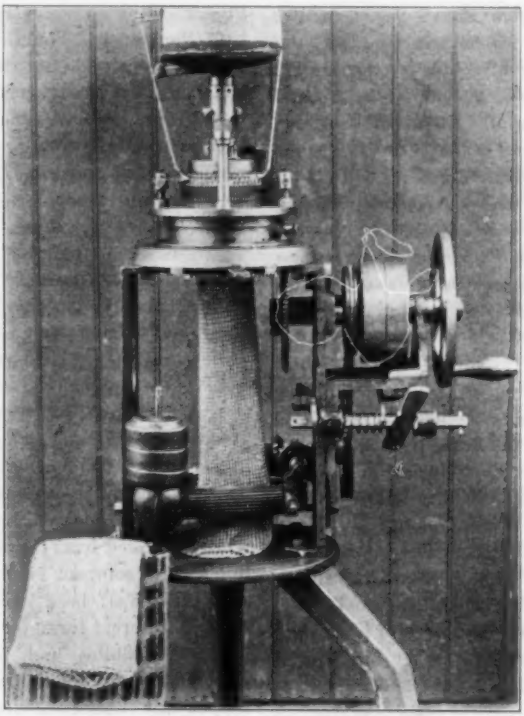
The object of this machine is to produce heavy goods, such as lumbermen's mittens, socks, etc., whose thickness and warmth will be greatly increased by the formation of short close loops thrown inward, making in connection with the main web, a warmth retaining fabric of substantial character.

In the machine illustrated, the inventor has used the skeleton, cam cylinder and needle cylinder of the regular Mayo machine, with somewhat of a change of cams. The rest of the machine is his own invention, including the looping device, which is the important feature. While Mr. Older has used the Mayo machine in this instance, he informs us that he can build the machine complete, as the needles are in his patent drawing, or his device can be applied to any make of machine. He informs us that the machine will knit web for twenty dozen pairs of mittens or ten dozen pairs of heavy (eleven or twelve pounds) socks in ten hours, and that one operator can run two or more machines. This for cut goods, it will be seen, is a very large output.

The machine has been practically tested and found successful. Over 700 dozen goods have been knit on it, with not a needle or pin broken in the looping device and a very small breakage in the knitting.

The machine is also adapted for making seamless socks, if desired, but in that case will not turn out near so many per day. The cut goods are finished up in the usual way. The loops thrown on the inside of the fabric will not ravel. We are informed that besides being adapted for use in conjunction with a circular two-thread machine, it can be adapted to a reciprocating knitter.

Mr. Older has not yet perfected his plans for putting the machine on the market, and may sell his patents outright.



A NEW DEVICE FOR KNITTING HEAVY SOCKS AND MITTENS.

POWER DEPARTMENT.

O. R. YOUNG, M. E., Editor.

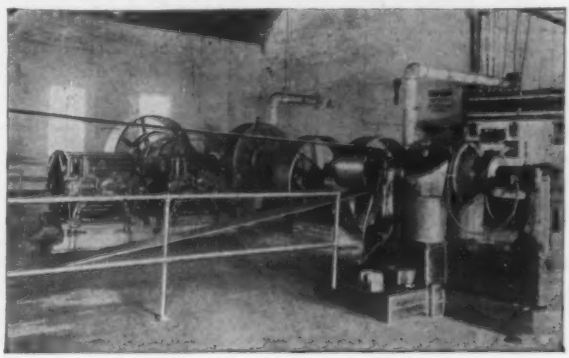
Electric Power in Factories.

The number of factories operated entirely by electricity and the motor, to the complete exclusion of the steam engine main belt, is daily receiving important additions as the benefits of the newer motive power become better and more generally recognized among manufacturers.

One of the latest converts to the new faith is the Miami Cycle & Manufacturing Company, of Middletown, Ohio, which operates an extensive factory in which work from 500 to 600 operatives. From this factory are turned out daily about 200 bicycles, all of a high grade, and in giving to the wheels their high degree of excellence, the company freely acknowledges the service rendered by electricity.

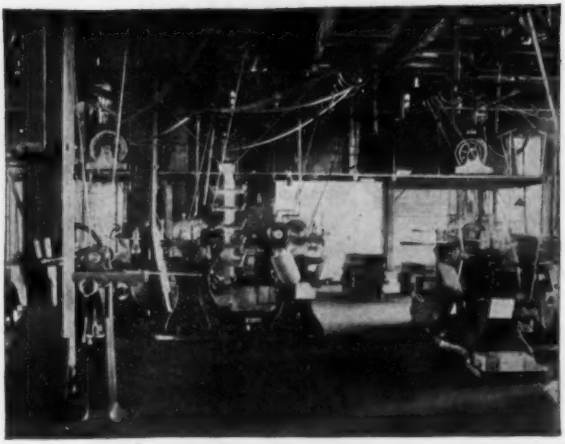
The electrical system employed is the monocyclic system developed by the General Electric Company, which allows, within certain limitations of distance, of the economical operation by the single-phase alternating current of motors and lights from the same circuit, without in any way interfering with the regularity of the lights. For long distance transmission, the three-phase system of the same company has been found most economical.

MIAMI CYCLE & M'F'G COMPANY'S PLANT.



INTERIOR GENERATOR STATION, MIDDLETOWN, OHIO.

The current to operate the Miami Company's plant is brought about a mile by wire, from the station of the



INDUCTION MOTORS IN MACHINE SHOP.

Middletown Electric Light & Power Company, where it is generated from a monocyclic generator, and turned into the wires at 1100 volts. On its arrival at the factory it passes into a substation and through six 30 kilowatt oil-cooled transformers, which reduce the pressure down to about 115 volts for distribution to the motors. The current for the lighting circuits is taken from two 7 1-2 K. W. and one 15 K. W. transformers.

From the transformers the secondary wires run north and south to the motors and lights in the two legs of the L. Those running south operate in the machine shop three 20 h.p. motors, each belted to a line of shafting about 180 feet long, carrying 80 belts. One of these motors is used to drive 15 lathes, 4 shapers, 6 milling machines, 3 water emeries, 1 planer, 1 die sinker, 2 universal grinders, 2 gear cutters and 2 drill binders. The other two operate 35 screw machines, 1 oil separator, 1 oil pump and 2 high pressure blowers, giving air to the forges in the blacksmith shop.

The circuits running north bring current to three 30 h.p. motors, two of 10 h.p., and two of 5 h. p.; one of the 10 h. p. motors is set up in the drill room, and runs a shaft from which belts drop to 12 large and 3 small drill presses, 2 cone grinders and 4 small milling machines. In addition it operates 1 band saw, 1 circular saw, and 1 wood turner's lathe in the pattern room adjoining.

MACHINERY DRIVEN BY MOTORS.

The other 10 h.p. motor is in the frame making department, where it drives 3 large punch presses for the manufacture of handle bars, seat posts,

etc., 3 large drill presses, 4 small ones, 2 frame assembling tables, 3 small milling machines, 2 emery grinders, 1 swaging machine, 4 stock machines, 2 tooth cutters and 1 double polishing lathe.

A large portion of the power coming into the factory is used in the polishing room occupied by 35 double polishing lathes, operated by two 30 h. p. motors. Another 30 h.p. motor drives a 48-inch exhaust blower, which carries away the dust from the polishing room. In the assembling department a 5 h.p. motor operates a freight elevator of 1500 pounds at 60 feet per minute capacity running up and down through the room. This 5 h. p. motor, which was at first deemed too small, not only operates the elevator satisfactorily, but also has sufficient power left to drive 5 small drill presses. The other 5 h.p. motor drives a 4 K.W. plating dynamo.

All these motors are of the General Electric Induction type, without commutator, collector or moving contacts. They are set up on platforms swung from rafters in the rooms, an arrangement rendered possible by the fact that they require no attention beyond an occasional oiling, and thus occupy no floor space whatsoever.

The introduction of the induction motors into these works was the result of pure conversion. Skeptical at first, the company, willing, however, to allow a trial, permitted the installation of a 20 h.p. motor as an experiment. It reached the factory in September, 1895, was put into service in the machine room, and ran the machines for the night shift. The experiment was as severe a test as could well be imagined for a motor. It ran over 300 feet of 3-inch shafting, 172 belts, 5 screw machines and 17 other machines such as drills, lathes, etc. The usual course was to add machine after machine until the motor stopped. One or two would then be thrown off and, under an excessive overload which brought it within reach of breaking down, the motor continued to run for its shift of ten or twelve hours. No accident happened to it during the two months this course of treatment continued. Its missionary work was successful. It was purchased by the Cycle Company, which ordered eight others at once, to be sent by express, afterwards increasing their order to nine. Their factory could not be electrically equipped too soon for them. The constant speed given to the machinery by the motors has enabled them to turn out a wheel with workmanship of peculiarly high quality, and its success has compelled them to enlarge the works, which are entirely lighted with lamps taking current from the same monocyclic generator.

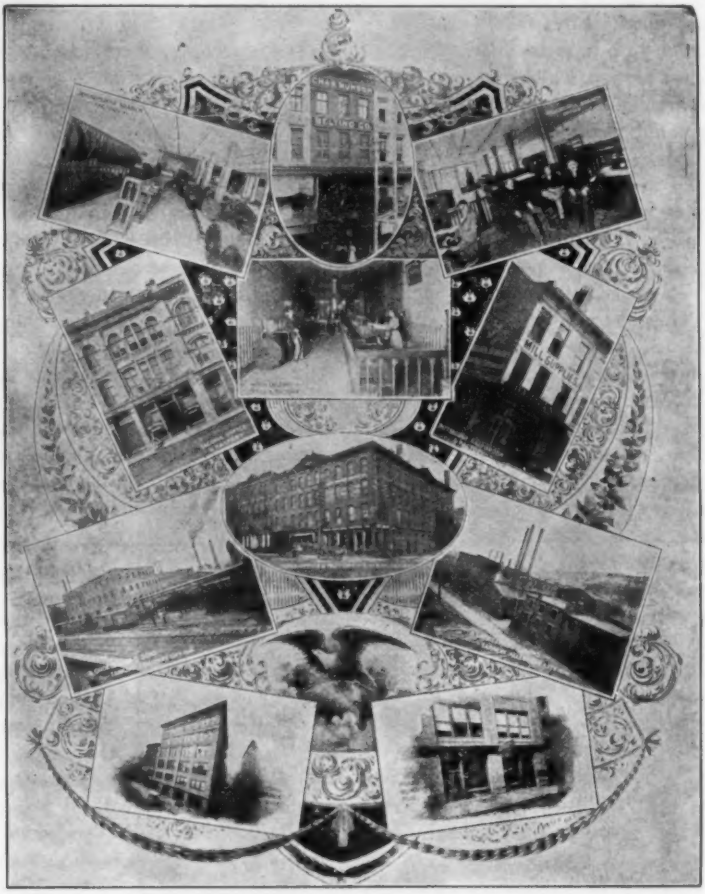
In addition to the load at the Miami Cycle Works, the generator supplies current to 500 to 600 lights throughout the town, and 650 incandescents in the Sorg Opera House. With 50 h.p. in motors and 400 incandescent lamps burning at the cycle works, and as many in the city, the lights in the opera house burn brightly and without flickering.

The Charles Munson Belting Co.

Continuous and uninterrupted success for more than a score and a half years, is the record of the enterprise now known as the Charles Munson Belting Co. In 1864 Mr. Charles Munson began the business on a limited scale; but it grew regularly and continuously, and in 1886 it was incorporated under its present title. Since the decease of Mr. Munson four years ago, the executive management has been in the following hands: The president is A. Groetzinger, of A. Groetzinger & Sons, proprietors of one of the largest tanneries in the United States, at Allegheny City, Pa.; the general manager is W. C. Groetzinger, and the secretary is E. A. Groetzinger, both of whom are sons of the president.

All the principal cities of the United

States contain representatives of the company; but the sale of the "Eagle" brand of leather belting is not confined to this country, but it finds its way all over the civilized world. The "Eagle" belting is claimed to be among the cheapest for transmitting power, on account of its superiority. It is manufactured wholly of pieces running less than four feet two inches in length, including lap, and is all cut from the butt portion of the hide. Were the cuts longer, better discounts could be given, but when the length is increased beyond that mentioned, great risk is run in cutting into soft, spongy leather. This fact is not easily detected when the belt is made up, though after the belt has been transmitting power for a short time the poor quality of the leather is apparent. Where the hardest work is required, the Munson "Eagle" brand of belt is especially guaranteed, as the leather used is all of pure oak tannage, and from one tannery only.



The factory of the company is one of the largest and best equipped in the United States, and its output meets with a large and steady increase in trade. Owing to this constant growth, an Eastern branch has been established at 116 and 118 North Fourth St., Philadelphia, where a full and complete stock of leather belting is carried. This enter-

prise, which is under the management of H. F. Pratt and Theo. Zwissler, assisted by J. H. Shay as head salesman, is meeting with unusual success. The branch house is also equipped with a modern belt factory, in charge of one of the best experts in the country, and is able to manufacture or repair leather belting up to sixty inches in width. Users of belting will find it to their interest to communicate with this company, as they are prepared to offer superior belting at the lowest possible figures consistent with honorable and upright dealing.

Steam Supplies.

There are many textile manufacturers who find it preferable to have all steam fitting and plumbing repairs about their mills attended to by one who is on the ground—an employee of the establishment who may be pressed into service without additional expense or loss of time. To these we would have a word or two regarding the purchase of the necessary supplies for such work, such as valves, cocks, wrought iron pipe and fittings, brass work for steam, water, gas, oil, chemicals, engineers' tools, etc.

The John Simmons Co., 106-110 Centre St., New York City, one of the "old reliables" among supply houses has long catered to this class of trade and are in a position to give it special attention. There is nothing in the way of plumbing and steam fitting supplies that this concern cannot furnish and furnish quickly. The goods they handle are each and every one of known reputation and worth so that a business connection with them invariably proves satisfactory. More than this they sell at manufacturers' prices, which is a fact worth remembering.

The John Simmons Co., have several specialties of their own which have attained wide-spread popularity. Among these their cast iron drainage fittings which we illustrate have been especially favored. These fittings are made with an interior shoulder and have the same inside diameter and capacity as the pipe with which they may be used, so that when screwed together a flush joint is secured, leaving an unobstructed interior surface. This allows all solid matter to pass through without choking up the pipe.

The John Simmons Co., are the eastern agents for the celebrated "Jarecki" cast iron fittings, cocks, etc., of which they carry a complete stock. They also have a finely equipped machine shop and manufacture and repair tools,

JARECKI CAST IRON FITTING.

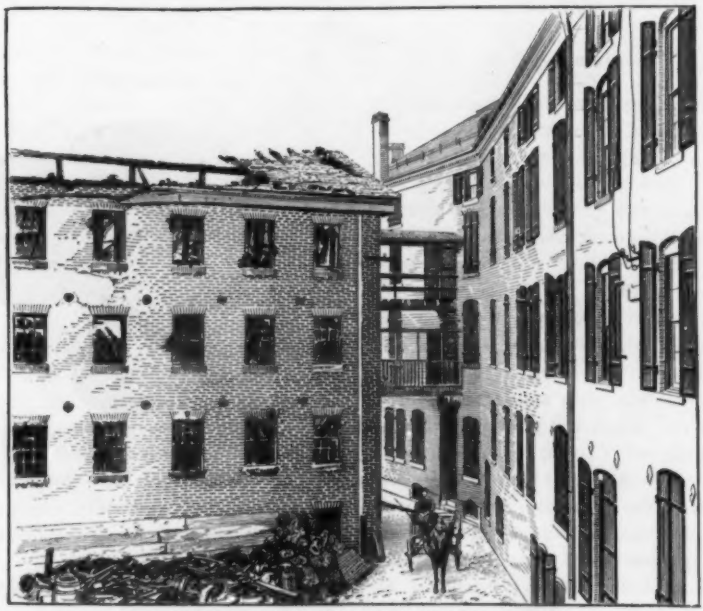
such as stocks, dies, taps, tongs, and turn out box and wall coils, worm and screw coils, for use in steam heating, cold storage, etc.

With 30 pipe cutting and threading machines they have unequaled facilities for cutting and bending pipe, 1-8-inch to 16 inches, either from sketch or specifications.

The company will be pleased to correspond with mill superintendents and others in charge of manufacturing establishments generally, desiring first-class plumbing or steam supplies at lowest prices and will send circulars, illustrated catalogue and further information upon application.

The Value of Corrugated Iron Shutters.

Protecting buildings from fire from adjacent buildings is a problem which has engaged the attention of architects and engineers for a number of years. To light the interior of any building over one story in height, windows must be provided, and when buildings stand in close proximity to each other, it is necessary to protect the openings in order to prevent fire from communicating between. What constitutes the best protection, under these circumstances, is a question not easily decided, but we wish to call the attention of our readers to a case which has lately come under our notice, which would seem that corrugated iron shutters, when properly made and properly fitted, are a most valuable protection against the spreading of fire.

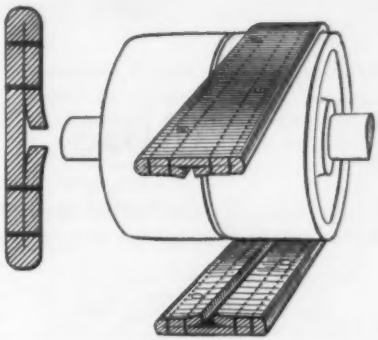


A FIRE AT RUSSELL & ERWIN'S PLANT.

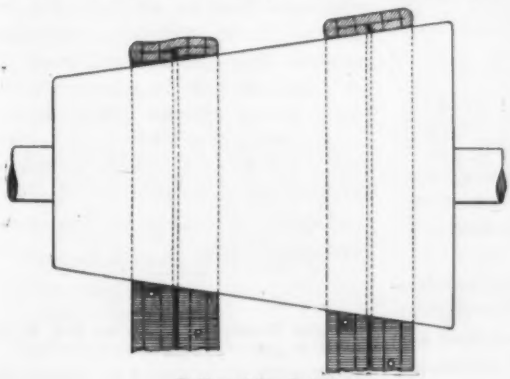
The illustration shown herewith is sketched from the ruins of a fire in the large manufacturing plant of the Russell & Erwin Mfg. Co., at New Britain, Conn. The building shown in the illustration on the left was completely destroyed, the interior being entirely burned out. The building on the right is one of the main buildings, six stories in height, and had the fire communicated with that the entire plant would have been destroyed. The openings as shown in the illustration were protected by the Berlin Iron Bridge Company's corrugated iron doors and shutters, which are nightly closed by the watchman. The heat from the burning building was very intense, yet owing to the window openings in the adjacent building being protected with these corrugated iron shutters, no fire communicated across the opening, which was but 15 feet in width, and the entire plant, costing millions of dollars, was saved from destruction. The heat was so intense that any ordinary wooden shutter covered with tin would doubtless have been entirely destroyed, and a flat, iron shutter would probably have been warped so as to have been no protection. It is seldom that so practical a test of fireproof shutters is made.

Increase Your Production.

Every manufacturer is seeking for ways to increase his output without materially adding to the cost of the labor. The claim is made, and from evidence we have seen, it looks as if it can be proven, that by the use of the Chicago raw hide belts an increase of from two to four picks per minute can be secured with no additional expense. Carrying this increase throughout the entire plant, and a handsome addition to the dividend account will be made. Lack of space will prevent more than a partial enumeration of the good points of this style of belts. Strength, durability and great driving power are prominent features. Being light in weight and having a soft, pliable surface, the claim is made that they will give from ten to twenty per cent. more driving power. Another point, to which attention is directed, is the turned edge, which contributes largely to the lasting qualities of the belt.

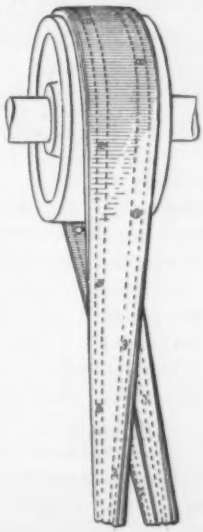


Section of Belt on Plain Pulley.



Belt on Cone Pulley.

The Chicago Rawhide Mfg. Co. are makers of other styles of belting, but they have named this one "Perfection." A glance at the transverse section of the belt and its position on a cone pulley, will be a convincing argument. It will be noticed that the working face is divided into parallel sections, and when placed over a pair of conical pulleys and tension is brought upon it, the sections hug the pulleys closely for the whole width of the belt, the backing yielding sufficiently to allow this effect. The result is that the belt works with little wear, and with a considerable increase in the driving power. The points of advantage for use on conical pulleys are equally applicable to rapid running shifting belts and for quarter turns.



As the belts are made of one piece of leather in width and turned over the edges cannot possibly open at the sides by coming in contact with the shifter. The loose joint in the centre entirely prevents opening and the plys separating when used as a quarter turn belt. These belts are made from the best raw hide butts, prepared by a patented process. Manufacturers who look closely to economy in production should address H. L. Weaver, manager for the company, 191 High St., Boston. Samples, prices and full information will be forwarded at once.

COLORS AND DYEING.

Conducted by CONYERS B. FINCKEL,

Professor of Chemistry and Dyeing at the Philadelphia Textile School, in whose Dye-house the tests are made.

Dye Receipts for May, 1896.

A Sample Color Sheet is issued each month by the TEXTILE WORLD, showing tests made by Conyers B. Finckel, Professor of Chemistry and Dyeing, in the Philadelphia Textile School, according to the recipes given in the TEXTILE WORLD. We show the latest colors and methods from month to month, and other tests of interest to the dyer. The extra cost of the Dyed Sample Sheets is $1.00 per year.

No. 33.

Dull Yellow on Cotton Cloth.

Dyed with Phosphine; Wm. Pickhardt & Kuttroff, 98 Liberty St., N. Y. On a mordant of Tannic Acid and Antimony.

(For 100 lbs. of cotton cloth.)

Mordant as follows:

15% Sumac Extract (Sharpless Dyewood & Extract Co.).

Enter the cloth (previously wet out) at 180° F., keep running at this temperature for 1 1-2 hours. Squeeze, and run for 20 minutes in a cold bath of

2% Antimony Salt (O. S. Janney & Co.)

Wash thoroughly, and dye as follows:

2% Phosphine,
10% Glauber's Salt (calcined sodium sulphate),
3% Alum (ammonium aluminium sulphate).

Enter at 100° F., raise the temperature of the dye bath to 160° F., and keep running at this temperature for 45 minutes. Dye without washing.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

This dyestuff is frequently sold under the name of Chrysaniline, Philadelphia Yellow and Aniline Orange. It comes in the form of an orange-yellow powder, and dissolves easily in water, forming an orange colored solution, with a greenish yellow fluorescence. After dyeing, the bath is not exhausted, and should be kept for further use. This is one of the not numerous yellow dyestuffs which are applicable on a mordant of sumac and antimony. It can also be used in combination with blue and red dyestuffs in the production of compound shades. The dyestuff itself is expensive, and has been largely replaced by other yellow dyestuffs giving equally good results, at a lower price. Phosphine not being a uniform substance, the commercial article differs in quality and shade. It can also be dyed on unmordanted cotton.

No. 34.

Bright Orange Yellow on All Wool Cloth.

Dyed with Citronine AA; Sykes and Street, 85 Water St., N. Y.

(For 100 lbs. scoured woolen cloth.)

Dye bath is made up as follows:

2% Citronine AA,
4% Oil of Vitriol (sulphuric acid),
15% Glauber's Salt (calcined sodium sulphate).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dye bath to the boiling point in 20 minutes, and continue boiling for 30 minutes. Wash and dry.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

This dyestuff is also known as Acid Yellow S, and not infrequently met with under the name of Naphthol Yellow S. Citronine AA comes in the form of an orange-yellow powder, dissolving easily in water, forming a yellow solution. Naphthol Yellow S, the most common name for this dyestuff, is frequently ad-

ulterated with the cheaper Naphthol Yellow. This, however, can be detected by heating the solution of the dyestuff with hydrochloric acid. Naphthol Yellow will be precipitated, while the Naphthol Yellow S remains in a clear solution.

Citronine AA can be used for the dyeing of wool or silk. In wool dyeing, the sulphuric acid and Glauber's salt can be replaced by sodium bisulphate. And it is recommended to add the acid gradually for the full development of the color and the production of an even shade. The dye bath is not exhausted. This dyestuff can be used advantageously in combination with red and blue dyestuffs, for the production of shades of green, orange, brown, tan, etc.

No. 35.

Lemon Yellow on Cotton Cloth.

Dyed with Thioflavine S; W. J. Matheson & Co., 178 Front St., N. Y.

(For 100 lbs. of cotton cloth.)

Dye bath is made up as follows:

3% Thioflavine S,
5% Soap (olive oil soda).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dye bath to the boiling point, and continue boiling for one hour. Wash and dry.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

This dyestuff comes in the form of an orange-yellow powder, dissolving in water with a golden yellow solution. The dyestuff is easily soluble in water and goes on to the fibre easily and evenly. It can also be dyed with common salt, Glauber's salt, borax, sodium phosphate or sodium carbonate. The bath is not exhausted and can be kept for future use. This dyestuff is applicable to wool, silk or cotton, but is mostly considered as a cotton dye. It can be used in combination with Congo colors, Benzo colors or Diamine colors, for the production of compound shades.

No. 36.

Brownish Yellow on All Wool Cloth.

Dyed with Extract of Fustic; Sharpless Dyewood & Extract Co., Bourse, Philadelphia. On a mordant of Chrome and Lactic Acid (Avery Chemical Co).

(For 100 lbs. scoured woolen cloth.)

Mordant as follows:

3% Chrome (bichromate of potash),
2% Lactic Acid (Avery Co).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dye bath to the boiling point in 30 minutes, and continue boiling for one hour. Wash and dye as follows:

5% Fustic Extract.

Enter the cloth at 160° F., raise the temperature of the dye bath to the boiling point, and continue boiling for one hour. Wash and dry.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

It may seem strange that we are showing up a shade dyed with a dyestuff so well known and old as Fustic, but as it is our purpose to show a variety of yellows, the one produced in this way could not possibly be left out. This sample of Fustic extract is made from old Fustic, and is very soluble in water; the dyebath is almost exhausted. Besides being dyed on a mordant of chromium, Fustic can be dyed on other metallic mordants with the following results: Aluminium (bright yellow); Iron (dark olive); Tin (bright yellow to orange yellow); Copper (olive). Fustic is used in the production of fast colors, in combination with logwood and alizarin dyes will produce a great variety of compound shades.

No. 37.

Yellow on Cotton Cloth.

Dyed with Auramine O; Wm. Pickhardt & Kuttroff, 98 Liberty St. On a mordant of Tannic Acid and Antimony.

(For 100 lbs. of cotton cloth.)

Mordant as follows:

15% Sumac Extract (Sharpless Dyewood & Extract Co.)

Enter the cloth (previously wet out) at 180° F., keep running at this temperature for 1 1-2 hours. Squeeze, and run for 20 minutes in a cold bath of

2% Antimony Salt (O. S. Janney & Co).

Wash thoroughly and dye as follows:

2% Auramine O.

Enter the cloth at 100° F., raise the temperature of the dye bath slowly to 140°, and keep running at this temperature for 45 minutes. Dye without washing.

In dyeing this sample the amount of water used in the dye bath was about 100 times the weight of the cloth.

Auramine comes into the market in the form of a yellow powder; it is sparingly soluble in water, except when hot or slightly acidulated, giving a light yellow color. The solution is decomposed on boiling, and if dyeing with Auramine is carried on at an elevated temperature (that is above 160° F.), the shade turns greenish and dull.

Auramine O is the purest quality in the trade, and some brands are found marked 1, 2 and 3; these contain dextrin.

Auramine dyes cotton, wool and silk. Cotton is dyed either with or without a mordant. To obtain pure colors, it is recommended to soap the cotton between the mordanting and the dyeing. The use of acids with Auramine is to be avoided, and when it is necessary to use an acid, acetic acid should be used. Auramine is of great importance in cotton dyeing, both as a straight color or in combination with such dyestuffs as Saffranine Magenta, Cotton Blue, Methyl Violet, Chrysordine and Malachite Green; with these a large variety of compound shades can be produced.

No. 38.

Brilliant Yellow on All Wool Cloth.

Dyed with Yellow S; Wm. Pickhardt & Kutroff, 98 Liberty St., N. Y.

(For 100 lbs. scoured woolen cloth.)

Dye bath is made up as follows:

2% Yellow S,
4% Oil of Vitriol (sulphuric acid),
15% Glauber's Salt (calcined sodium sulphate).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dye bath to the boiling point, and continue boiling for 30 minutes. Wash and dry.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

This dyestuff is very similar to Brilliant Yellow S and Fast Yellow G. It comes into the market in the form of an orange-yellow powder, dissolving easily in water, forming a yellow solution. The dye bath is not exhausted and can be kept for future use.

The dyeing can take place using sodium bisulphate, in place of the sulphuric acid and Glauber's salt. An excess of acid should be avoided, as it reddens the shade. Yellow S is only used for wool and silk dyeing; it is valuable in dyeing compound shades on wool, owing to its feeding on to the fibre very evenly.

No. 39.

Brilliant Yellow on Cotton Cloth.

Dyed with Chrysophenin; Farbenfabriken of Elberfeld Co., 77 William St., N. Y.

(For 100 lbs. of cotton cloth.)

Dye bath is made up as follows:

3% Chrysophenin,
30% Common Salt (sodium chloride).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dyebath to the boiling point, and continue boiling for one hour. Wash and dry.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

Chrysophenin is probably the purest and most brilliant of all the yellow dyestuffs known as direct cotton colors, or colors dyeing in one operation, usually

spoken of as one-dip dyes. It comes into the market in the form of a bright orange-yellow powder, which is sparingly soluble in cold water, but very soluble in hot water, forming a yellow solution.

Chrysophenin dyes a wool and cotton. On bleached cotton, very fine light and clear yellows are produced, which are fairly fast. The dyeing should take place in the presence of a sodium compound, the one generally used being common salt. Besides these, can be used soap, phosphate of sodium, borax or sodium carbonate and Glauber's salt.

On wool it is dyed with the addition of sulphuric acid to the dye bath.

Chrysophenin is most valuable in cotton dyeing, and can be used with the other one-dip colors for the production of compound shades.

No. 40.

Yellow on All Wool Cloth.

Dyed with Alizarine Yellow AW (powd); Wm. Pickhardt & Kuttroff, 98 Liberty St., N. Y. On a mordant of Chrome and Tartar.

(For 100 lbs. scoured woolen pieces.)

Mordant as follows:

3% Chrome (bichromate of potash).
1½% Tartar (bitartrate of potash).

Enter the cloth (previously wet out) at 160° F., raise the temperature of the dye bath to the boiling point in 30 minutes, and continue boiling for one hour. Wash and dye as follows:

4% Alizarine Yellow AW (powd).

Enter the cloth cold, and run cold for 20 minutes, raise the temperature of the dye bath to the boiling point in one hour, and continue boiling for 40 minutes. Wash and dry.

In dyeing this sample, the amount of water used in the dye bath was about 100 times the weight of the cloth.

This dyestuff comes into the market in the form of a bright yellow powder, quite soluble in cold water, forming a yellow solution. It can be used for the production of compound shades by combining it with the other alizarins or with the wood colors. If care is taken in handling, there is no difficulty in producing even shades, which at the same time are full and bright.

NOTE. In all these receipts, the amount of water given is larger than that which would be used in practice. This is necessary, as the amount of cloth dyed is very small. Consequently these same receipts would be apt to give darker shades when dyed on a large amount of cloth, as is done in the dyehouse ordinarily.

Remarks on the Dyed Samples.

We have departed somewhat from the regular order of dyed samples, and for this month want to show some of the standard yellows with their properties and application. At some future date we hope to follow up this line by showing the red, blue, green, orange and violet shades. By comparison of these yellow shades, together with a study of their behavior towards acids and alkalis, and their fastness to scouring solutions, we feel that the reader cannot fail to receive some valuable information.

Sample 33 shows a good shade of yellow, which, however, is a trifle dull and borders on the orange. The number of yellow dyestuffs belonging to this class of colors is somewhat limited, and this is not what would be called a pure yellow, neither does it dye a shade which is very fast. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is very much altered, being reduced almost to a straw color of a dull tone. (Soap alone has not such a marked effect.) White yarn plaited with it and scoured in the same solution is stained, showing the color is not at all fast to fulling or scouring. The scouring bath also extracts a yellow color which shows in the solution.

The dyed sample gives the following tests with hydrochloric acid, sulphuric

acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, brighter and pale yellow color extracted; hot, pale yellow and yellow color extracted.

Sulphuric acid (10 per cent. solution) cold and hot, the same as with hydrochloric acid.

Ammonium hydrate (concentrated) cold and hot, pale yellow and yellow color extracted.

Sodium hydrate (10 per cent. solution) cold, lighter and duller; hot, pale dull yellow; yellow color extracted.

Sample 34 shows a good, bright and full yellow and one that is quite fast; the shade is purer than that produced by the ordinary naphthol yellow, being slightly faster in every respect. It has been largely used to replace picric acid. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is scarcely altered, if anything, it becomes brighter, a slight yellow color shows in the scouring bath. White yarn plaited with it and scoured in the same solution is not stained showing the color to be fast to scouring and fulling.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, trifle more on the orange; hot, the same.

Sulphuric acid (10 per cent. solution) cold, no change; hot, the same as with hydrochloric acid.

Ammonium hydrate (concentrated) cold, trifle more orange; hot, orange and faint red color extracted.

Sodium hydrate (10 per cent. solution) cold, brown; hot, redder brown and brown color extracted.

Sample 35 shows a good, bright and clear yellow on cotton and one which is very fast to scouring, it is, however, sensitive to light and acids. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is unaltered, if anything, it becomes a trifle brighter; no color is extracted in the scouring bath, and white yarn plaited with it and scoured in the same solution is not stained, showing the color to be fast to scouring and fulling.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold and hot, red orange shade.

Sulphuric acid (10 per cent. solution) cold and hot, the same as with hydrochloric acid.

Ammonium hydrate (concentrated) cold and hot, no change.

Sodium hydrate (10 per cent. solution) cold, a trifle more on the orange; hot, the same.

Sample 36 shows one of the fastest yellows on wool, although it cannot be classed as a pure and bright yellow, due to the influence of the metallic salt (chromium) with which the fibre is prepared before dyeing. On aluminum mordanted wool, the shade is a pure and bright yellow, but not so fast as the one here shown. The principle of dyeing in this case is based upon the formation of a color lake which is an insoluble precipitate, and consequently gives colors which are very fast. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is unaltered, except that it is just a trifle redder, and no color is extracted in the scouring bath; white yarn plaited with it and scoured in the same solution, is not stained, showing the color to be fast to scouring and fulling.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate, and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, yellow; hot, paler and duller yellow.

Sulphuric acid (10 per cent. solution) cold, yellow; hot, quite a pale and dull shade of yellow.

Ammonium hydrate (concentrated) cold, orange; hot, same only a trifle redder.

Sodium hydrate (10 per cent. solution) cold, orange; hot, the same only redder and yellow color extracted.

Sample 37 shows one of the purest shades of yellow on cotton, which can be dyed on a mordant. The color, however, is not fast, and it is only used for certain classes of work. As it is very sensitive to heat it cannot be used at all for printing; it is, however, of importance in cotton dyeing, owing to its pure and brilliant shade of yellow. It is also of great use for compounding. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the color is very much altered and some of it is extracted and stays in the scouring bath, the shade becomes a dirty looking dull yellow. White yarn plaited with it and scoured in the same solution is considerably stained, showing the color is not fast either to scouring and fulling.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, pale yellow and yellow color extracted; hot, color destroyed.

Sulphuric acid (10 per cent. solution) cold and hot, the same as with hydrochloric acid.

Ammonium hydrate (concentrated) cold and hot, the shade becomes very dull.

Sodium hydrate (10 per cent. solution) cold, color almost destroyed, reddish color extracted; hot, the same, no color extracted.

Sample 38 shows another bright and pure shade of yellow on wool, dyed in a single operation and possessing considerable fastness. This can be used for all classes of worsted and woolen work, where fastness to fulling is not required. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is unaltered, except that it is just a trifle more on the orange, a faint yellow color is extracted in the bath. White yarn plaited with it and scoured in the same solution is stained, showing the color is not entirely fast to fulling, although it would be considered fast to scouring.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, no change; hot, the same only faint yellow color extracted.

Sulphuric acid (10 per cent. solution) cold and hot, the same as with hydrochloric acid (shade is redder when cold than hot).

Ammonium hydrate (concentrated) cold, red orange, faint red color extracted; hot, the same only duller.

Sodium hydrate (10 per cent. solu tion) cold, red brown, reddish color extracted; hot, the same only redder.

Sample 39 shows a good clear yellow on cotton dyed in one operation and producing a shade of considerable fastness. This is the brightest and purest shade of yellow belonging to the class of dyestuffs known as direct cotton colors. This also dyes wool a very fast color either in an acid or alkaline bath. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is not altered and no color is extracted in the scouring bath. White yarn plaited with it and scoured in the same solution, is slightly stained showing that while the color is fast to scouring it is not entirely fast to fulling.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, dull orange; hot, dull yellow tan.

Sulphuric acid (10 per cent. solution) cold and hot, the same as with hydrochloric acid.

Ammonium hydrate (concentrated) cold, bright yellow, yellow color extracted; hot, the same yellow color extracted.

Sodium hydrate (10 per cent. solution) cold, light orange yellow; hot, the same as cold.

Sample 40 shows a good yellow on wool, and one which is fast, being dyed on a mordant of chromium, the shade is somewhat of the same character as that proceeded by fustic, but is much clearer and brighter, and nearer a pure yellow. Scoured in a solution of 10 grammes of soap and 2 grammes of alkali to the litre of water at 130° F., the shade is practically unaltered, if anything it becomes a trifle more yellow; the scouring bath does not extract any of the color and white yarn plaited with it and scoured in the same solution is not changed, showing the shade to be fast to scouring and fulling.

The dyed sample gives the following tests with hydrochloric acid, sulphuric acid, ammonium hydrate and sodium hydrate.

Hydrochloric acid (10 per cent. solution) cold, red; hot, dull red and pink color extracted.

Sulphuric acid (10 per cent. solution) cold, red; hot, color almost destroyed, pink color extracted.

Ammonium hydrate (concentrated) cold and hot, no change.

Sodium hydrate (10 per cent. solution) cold, orange yellow; hot, orange, yellow color extracted.

NOTE. These tests are first made on yarn, and then dyed on the cloth. The tests for fastness are made in the original yarn samples.

CONYERS B. FINCKEL,
Prof. of Chemistry and Dyeing, Philadelphia Textile School.

Roundabout Notes.

Alizarine dyes are readily fixed on woolen fabrics in one bath for shades in which great fastness is no desideratum. A few good recipes may be given:

Brown on Cheviot.

2 pints acetic acid,
1½ pints chromic oxalate solution,
125 gallons of water, with
6% coerulein paste,
4% Alizarine Orange W.

Enter cold and work about 15 minutes. Then heat slowly, so that the boiling point is not reached till the stuff is nearly dyed.

Olive green on cheviot: The same proportions of acetic acid, oxalate of chromium and water, plus 15 per cent. of coerulein paste. Proceed up to the boiling point as with the above, but boil one hour and add keton blue to pattern.

Blue on cheviot: Exactly as in the first recipe, except that 15 per cent. Anthracene Blue WS extra is the dye used.

Dark blue on cheviot: Exactly as in first recipe, using, however, 15 per cent. Alizarine Blue GG doubled.

* * *

The chromic oxalate solution is prepared as follows: Dissolve oxalic acid in nine times its weight of water, and add as much chromic oxide as you can dissolve. This will be about 25 per cent. of the acid solution. Alizarine black and alizarine orange appear to give brighter but lighter shades with chromic oxalate than with bichromate. Alizarine cyanine black and alizarine black NR are very suitable for the one-bath process.

* * *

Bayers' sulphon cyanines, jet blacks and the old Sulphone Blacks G and R are all highly useful colors much in favor with dyers. Unfortunately, they will not stand steaming at high pressure under ordinary circumstances, and this is a cause for complaint. After repeated trials, however, the Elberfeld firm find that this disadvantage can be gotten over by adding from 1-2 to 2 per cent. of sulphate of copper, after the bath is exhausted of color, and continuing the boiling for another half hour.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Patterson, N. J.
Rowell, H. K, Waltham, Mass.

Automatic Boiler Feeds.
D'Este & Seeley Co, 29 Haverhill St, Boston

Bailing Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark N. J.

Bandings.
See under Yarns.

Banding Machines.
Cole Bros, Pawtucket, R. I.

Baskets.
Barlow, John W, Lawrence, Mass. (Rawhide).

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Charlotte Supply Co, Charlotte, N. C.
Chicago Raw Hide Mfg. Co, 191 193 High St, Boston.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son, Bolton, England.
Munson, Chas, Belting Co, Phila, Pa.
Paulus, J. C , & Co., Phila., Pa.
Popham, Henry, & Son, East Newark, N. J.
Rhoads, J. E, & Sons, 239 Market St, Phila, Pa.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.
Rhoads, J. E, & Sons, 239 Market St, Philadelphia, Pa.
Southwick, Geo. W, & Co, Stamford, Ct.

Bindings.
See Tapes and Braids.

Bobbin Covers.
Hegeman, John, Amsterdam, N. Y.

Bobbins, Spools, Shuttles, Etc.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.
Imperial Chemical Co, 432 Market St, Phila, Pa.
Lord, G. W, 316 Union St, Phila, Pa.

Boxes, Paper.
Palmer, J. S, 35 Wistar St, Germantown, Pa.

Boxes, Wooden.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes and Braids.

Braiding Machines.
Thun & Janssen, Reading, Pa.

Brushes.
Cocker, Thos, & Co, 151 North 4th St, Phila.
Hegeman, John, Amsterdam, N. Y.

Burr Pickers.
Atlas Mfg. Co., Newark, N. J.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.
American Card Clothing Co, Worcester, Mass.
Ashworth, Elijah, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Cutters.
Hand, Fredk, & Co, 159 Van Houten St, Paterson, N. J.

Card Feeds.
Atlas Mfg. Co , Newark, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Calico Printers' Machinery and Supplies.
New Bedford Copper Co, New Bedford, Mass.
See also Dyeing, Bleaching Machinery, etc.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemical Stoneware.
American Fire Brick Works, 2637 E. Cumberland St, Philadelphia.

Coal.
Dominion Coal Co, Ltd, 95 Milk St, Boston

Combs, Hackles, Pins, Etc.
Townsend, Thos, Manchester, Conn.

Cone Winders.
Jacobs, A. L, & Co, 92 State St, Boston.

Cop Tubes.
Jacobs, Arthur L, & Co, 92 State St, Boston.
Taylor, Chas. F, Providence, R. I.

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.
Brabender, Chas, & Son, Paterson, N. J.
Oat, Jos. & Sons, 232 Quarry St, Phila, Pa.

Cotton.
Blaisdell, S, Jr, Co, Chicopee, Mass.
Capelle, Herman, cor. Leonard St. and W. Broadway, N. Y.

Cotton Combs.
Townsend, Thomas, Manchester, Conn.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton Machine Co, Lowell, Mass.
Blaisdell Feeder Co, 29 Oliver St, Boston, Mass.
Cole Bros, Pawtucket, R. I.
Curtis & Marble Machine Co, Worcester, Mass.
Draper, Geo, & Sons, Hopedale, Mass.
Easton & Burnham, Pawtucket, R. I.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Jacobs, Arthur L, & Co, 92 State St, Boston.
Kilburn, Lincoln & Co, Fall River, Mass.
Knowles Loom Works, Worcester, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
McKerrow, H. G, & Co, 31 State St, Boston, Mass.
Mason Machine Wks, Taunton, Mass.
Providence Machine Co, Providence, R. I.
Saco Water Power Machine Shop, Biddeford, Me.
Thun & Janssen, Reading, Pa.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R, I.

Cotton Openers and Lappers.
Atherton Machine Co, Lowell, Mass.
Howard & Bullough American Machine Co. Pawtucket, R. I.
McKerrow, H. G, & Co, 31 State St, Boston, Mass.

Cotton Webbing.
Witter, H. M, & Co, Worcester, Mass.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.
D'Este & Seeley Co. (Curtis), 29 Haverhill St, Boston, Mass.

Dryers.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 54 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Philadelphia Turkey Red Dye Works, Putnam St, Phila.
Providence Dye Works, Kensington, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Napping Machine Co, Williamstown, Mass.
Bethune, L. W, 41 Liberty St, New York.
Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Delahunty Dyeing Machine Co, 152 N. Front St, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Smith & Drum Co, 2507-2509 Coral St, Philadelphia, Pa.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dyestuffs and Chemicals.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Arnold, Peck & Co, Providence, R. I.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 172 Purchase St, Boston, Mass.
Avery Chemical Co, 169 Devonshire St, Boston, Mass.
Beach & Co, Hartford, Ct.
Bischoff, & Co, 80 Front St, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Browning & Bros, 42 N. Front St, Phila, Pa.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Corey, S. J, 273 Congress St, Boston.
Dale Extract Co, Rahway, N. J.
Erie Chemical Co, Erie, Pa.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Gilbert Bros. & Co, 202 Purchase St, Boston.
Hanna, W. W, 52 N. Front St, Phila, Pa.
Harway Dyewood & Extract Mfg. Co, 184 Front St, N. Y.
Hill, Edward's, Son & Co, 25 Cedar St, N. Y.
Horsfall, Jonathan, 216 Chestnut St, Phila.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 14 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Kalle & Co., 77 John St., N. Y.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J, & Co, 178 Front St, N. Y.
Merrimac Chemical Co, 13 Pearl St, Boston.
Naumkeag Dye Co, Salem, Mass.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips, Moro Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt, Wm, & Kuttroff, 98 Liberty St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.

Dyers and Finishers.
Bay State Dyeing & Finishing Co, North Andover Depot, Mass.
Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Forsyth Co., New Haven, Ct.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Kensington Dye Works, Kensington, Pa.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Providence Dye Wks, Kensington, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyers' Clogs.
Wildman, Jos, & Co, 1908 N. Front St, Phila

Electrotyping and Printing.
J. J. Ryder & Co, 210 Westminster St, Providence, R. I.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Graves Elevator Co, Rochester, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
McCalvey Elevator Works, Phila, Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Engineers, Electrical.
Adams, A. D, 620 Atlantic Ave, Boston, Ms.
Smeallie Bros, Amsterdam, N. Y.

Engineers, Mechanical.
Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.
Smeallie Bros, Amsterdam, N. Y.

Engraving on Wood.
Russell, Albert C, 38 Pearl St, Boston, Mass.
Ryder Co, J. J, 210 Westminster St, Providence, R. I.

Express Money Orders and Travelers' Cheques.
American Express Co, offices in every city

Factory Sites.
Dolge, Alfred, Dolgeville, N. Y.
Elmira, N. Y.
Illinois Central R. R, 506 Central Station, Chicago, Ill.
Southern Railway, M. V. Richards, agent, Washington, D. C.

Feed Water Heaters.
Whitlock Coil Pipe Co, 67 South St, Elmwood, Conn.

Feed Water Pumps.
Phœnix Iron Foundry, Providence, R. I.
Smeallie Bros, Amsterdam, N. Y.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
American Fire Brick Works, 2637 E. Cumberland St, Philadelphia.

Fire Doors and Shutters. (Automatic.
Victor Mfg. Co., Newburyport, Mass.

Fire Hose.
Crosby Steam Gauge Co, Boston, Mass.
Rhoads, J. E, & Son, 239 Market St, Philadelphia, Pa.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River Mass.

Fuel Oil Furnaces.
Rockwell, W. S, & Co, 27 Cortland St, N. Y.

Fulling Mills for Knit Goods.
Hoben, J. A, Cohoes, N. Y.
Scott, H. W, Bennington, Vt.

Gas Singeing Machines.
Curtis & Marble Machine Co, Worcester, Ms.

Gear Cutting Machine.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Heating.
See Ventilating.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Hotels.
Green's Hotel, Eighth and Chestnut Sts, Philadelphia, Pa.

Humidifying Apparatus.
American Drosophore Co., 220 Devonshire St., Boston, Mass.

Hydro-Extractors.
American Tool & Machine Co, 302 Federal St, Boston.

Index.
Burr Index Co, 336 Asylum St, Hartford, Conn.

Jute Goods, Burlaps and Jute Yarns.
Wilmington Mills Mfg. Co, Wilmington, Del.

Knit Goods Brushers.
Jones, Lewis, Bristol, Pa.

Knit Goods Edgings, Trimmings, etc.
Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger, C, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.

Knit Goods Finishing Machines, Crochet, Etc.
Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Knitting Machine Cylinders.
Ashman, Stephen A, 3 Fetter Lane, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford, W, & Co, Little Falls, N. Y.
Stanton & Lewis, 318 Branch St, Phila, Pa.

Knitting Machinery.
American Tool & Machine Co, 302 Federal St, Boston.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Champion Sewing Machine Co, 1819 N Fifth St, Phila, Pa.
Cooper, Charles, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Co, South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave and Mascher St, Phila, Pa.
Hodgson & Holt, Laconia, N. H.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, Bristol, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine Co, Franklin, N. H.
Mueller, A. (Flat), 1533 Vine St, Philadelphia.
National Automatic Knitter Co, 728 Cherry St, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Payne, Geo. W, & Co, Pawtucket, R. I. (Winding and spooling.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stafford, W, & Co, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St, Phila, Pa.
Union Raveller Co, 469 River St, Troy, N. Y. (Ravellers.)

Knitting Needles.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Charles, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, N. H.
Star Needle Co, New Britain, Conn.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.

Lace Leather.
Rhoads, J. E, & Son, 239 Market St, Phila, Pa.
Southwick, G. W, & Co, Stamford, Ct.

Looms.
Bethune, L. W, 41 Liberty St, New York.
Crompton Loom Works, Worcester, Mass.
Draper, Geo. & Sons, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Gilbert Loom Co, Worcester, Mass.
Howard, Geo. C., 1783 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Knowles Loom Works. Worcester, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.
Barlow, John W, Spicket Mill, Lawrence Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.
Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Schofield, Geo. L, 123 N. Front St, Phila,
Scott, James, 123 No. Front St, Phila, Pa.

Machinery Wipers.
American Silk Mfg. Co, 311 Walnut St, Philadelphia, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Jacobs, Arthur L, & Co, 92 State St, Boston.
Whiton, The D. E. Co, New London, Conn.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Harmon St, Worcester, Mass.

Mails.
Walder, J, Paterson, N. J.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Charlotte Supply Co, Charlotte, N. C.
Chicago Raw Hide Mfg. Co, 191-193 High St, Boston.
Covel & Osborn, Fall River, Mass.
Hill, Jas, Mfg. Co, Providence, R. I.
Jacobs, Arthur L, & Co, 92 State St, Boston.
Popham, Henry, & Son, East Newark, N. J.
Sweet & Doyle, Cohoes, N. Y.
Thurston, A. G, & Son, Fall River, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass.
Parks & Woolson Machine Co, Springfield, Vt.

Office Supplies.
Dangel, Harry, & Co, 117 Milk St, Boston.

Oil Filter.
Peirce, A. T, Dover, N. H.

Oilless Bearings.
N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Paper Tubes for Cone Winders.
Jacobs, Arthur L, & Co, 92 State St, Boston.
Taylor, Chas. F, Providence, R. I.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Crossley, Arthur W, 23 Court St, Boston, Mass.
Miller, Jos. A, & Co, Butler Exchange, Providence, R. I.

Penstocks.
Dalrymple, Geo, Fair Haven, Vt.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.
Hudson Fibre Co, Hudson, N. Y.
Shuttleworth & Neville, Amsterdam, N. Y.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Alcott, T. C., & Son, Mt. Holly, N. J.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kilburn, Lincoln & Co, Fall River, Mass.
Smeallie Bros, Amsterdam, N. Y.
Watson, A, 2136 Dickerson St, Phila, Pa.

Presses.
Crawford, J. J, & Son, Nashua, N. H.
Curtis & Marble Machine Co, Worcester, Ms.
Hodgson & Holt, Laconia, N. H.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Taylor, James, 835 Arch St, Phila, Pa.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Pulley Coverings.
Lindsey Pulley Covering Co, 553 Grand St, Brooklyn, N. Y.

Pumps.
Smeallie Bros, Amsterdam, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.
Friedberger, C, Germantown, Pa.

Roll Coverers.
Barlow, John W (worsted rolls), Lawrence Mass.
Howland, Wm. O., 128 East 6th St., Chester, Pa.

Roller Skins.
Fell, Geo, & Son, Bolton, England.
Gerrish Wool & Leather Co, Manchester, N. H.
Winslow Brothers, Norwood, Mass.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roofing, Steel and Tin.
Chattanooga Steel Roofing Co, Chattanooga, Tenn.

Roving Cans and Sheet Metal Work for Mills.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Screws and Studs.
Phila. Machine Screw Works, 624 Race St., Phila., Pa.

Sewing Machines and Supplies.
Birch Bros., Somerville, Mass.
Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Singe Plates.
New Bedford Copper Co, New Bedford, Ms.

Sizing.
American Glutrose Co. Penn Mutual Bldg, Phila, Pa.

Skylights (Metal).
Van Noorden & Co, Boston, Mass.

Soaps.
American Soap & Washolene Co, Cohoes, N. Y.
Dean & Sutherland, 240 Chestnut St., Philadelphia, Pa.
Draper, J. O. & Co, Pawtucket, R. I.
Holbrook Mfg. Co., 406 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper, Geo, & Sons, Hopedale, Mass.
Easton & Burnham, Pawtucket, R. I.
Jacobs, Arthur L, & Co, 92 State St, Boston.
Providence Machine Co, Providence, R.I.
Whitin Machine Wks, Whitinsville, Mass.

Spinning Cylinders.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper, Geo, & Sons, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.
Providence Machine Co, Providence, R. I.

Steam Boilers.
Greenfield, W. & G., East Newark, N. J.
Sargent, J. Bradford, 8 Oliver St, Boston.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Damper Regulators.
D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.
Greenfield, W. & G., East Newark, N. J.
Newburgh Ice Machine & Engine Co, Newburgh, N. Y.
Sargent, J. Bradford, 8 Oliver St, Boston, Mass.
Toomey, Frank, 131 N 3d St, Phila, Pa.

Steam Kettles.
Walker & Pratt Mfg. Co, 31-35 Union St. Boston, Mass.

Steam Separators.
D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.

Steam Specialties.
Simmons, John & Co, 106-110 Centre St, N. Y.

Steam Traps.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).

Steel Castings.
Chester Steel Castings Co, 407 Liberty St, Phila, Pa.

Steel and Iron Roofing.
Chattanooga Steel Roofing Co, Chattanooga, Tenn.

Stop Motion for Looms.
Tucker Stop Motion Co., Hartford, Conn.

Tanks, Tubs and Vats.
Brabender, Chas, & Son, Paterson, N. J.
Burkhardt's, Geo. J., Sons, 2331 N. Broad St, Phila, Pa.
Corcoran, A. J, 11 John St, N. Y.
Cypress Lumber Co, Apalachicola, Fla.
Cypress Tank Co, Bridgeport, Florida.
Hall, Amos H, No. 2nd above Cambria, Phila, Pa.
Oat, Jos, & Sons, 232 Quarry St, Phila, Pa.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes and Braids.
Eddy & Street, 11 So. Water St, Providence, R. I.
Fleming & Chapin, 215 Church St, Phila, Pa.
Kenyon, John J, Pawtucket, R. I.
Perseverance Mills, 2632-40 Mascher St Phila, Pa.
Witter, H. M. & Co, Worcester, Mass.

Teasels.
Kellogg, Thos. C, Skaneateles, N. Y.
Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.
American Express Company.

Turbines.
James Leffel & Co, Springfield, Ohio.

Valves.
D'Este & Seeley Co, 29 Haverhill St, Boston, Mass.

Ventilating Apparatus.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
New England Heating & Ventilating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Van Noorden & Co, Harrison Ave, Boston, Mass.

Warp Compressing Machine.
Worcester Warp Compressing Machine Co Worcester, Mass.

Watchman's Clock.
Hausberg, E. O, 41 Maiden Lane, N. Y.
Nanz & Co, 116 Chambers St, New York.

Water Wheels.
Alcott, T. C., & Son, Mt. Holly, N. J.
Burnham Bros, York, Pa.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.
Replogle Governor Co, Akron, Ohio.

Winders.
Jacobs, Arthur L, & Co, 92 State St, Boston.

Winders. (Cone.)
Jacobs, Arthur L, & Co, 92 State St. Boston.

Winders. (Hosiery.)
Payne, Geo. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.
Sweet & Doyle, Cohoes, N. Y.

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Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 136 N. Front St. Phila, Pa.

Wool Cleaning Compound.
Dean & Sutherland, 240 Chestnut St, Phila, Pa.
India Alkali Works, Boston.

Wool Cleaning Process.
International Safety Solvent Co., Providence, R. I.

Wool Combs.
Townsend, Thos, Manchester, Conn.

Wool Combing Machinery.
Crompton Loom Works, Worcester, Mass.

Wool Extracts.
Daly, Jas. E., & Co., 105 River St., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Hudson Fibre Co, Hudson, N. Y.
Mohawk Mfg. Co, Oswego, N. Y.
Muhlhauser, F, Co, Cleveland, Ohio.

Wool and Waste Dusters.
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Sargents', C. G., Sons, Graniteville, Mass.
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Thun & Janssen, Reading, Pa.
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Woonsocket Machine & Press Co, Woonsocket, R. I.

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Garfield Woolen Co, Garfield, N. J.
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Muhlhauser, F, Co, Cleveland, Ohio.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

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Colored Cotton Yarns.

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Naphtazine Blue (Pat.)—a fast acid Navy Blue for Wool.

FAST DIRECT BLUES, Pat'd. for Cotton and Mixed Goods, Wool and Cotton, Silk and Cotton.

FAST DIAZOTABLE BLACKS, PAT'D.

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A Perfect Disinfectant.

Odorless, Colorless, Efficacious, Economical.

Put up in 5 and 10 gal. kegs, half bbls. and bbls; prices 50c., 40c. and 30c. per gal., according to quantity.

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Faster than Alizarine Colors and produced at ONE-HALF the cost.

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Caustic Potash, Calcined Carb. Potash.

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ONE DIP BLACK DYE, CUTCH EXTRACT.

Importers of Indigo, Cutch, Madder, Chemicals, &c.

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COMMERCIAL LACTIC ACID MORDANT.

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Glutrose Sizing will effect a saving of 20% to 30% of Starch. Warps sized with this Compound resist atmospheric changes and the goods leave the loom in a finished condition.

Glutrose Core Compound makes excellent cores of burnt sand and is the cheapest and best Core Compound ever put on the market.

Finishing Glutrose will make the best of paste with common wheat flour and save money on flour bills.

Manufactured by AMERICAN GLUTROSE WORKS.

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ANCHOR COLOR MFG. CO. 464-66 Cherry St. NEW YORK.

Genevan Blue "C" { bright, fast color, specially adapted for Hosiery goods.

Lactic Acid, { free from adulteration. **Does Not Strip.**

Anilines and Alizarines, { **Genevan Blue, Anatase Blue. Genevan Brown, Cotton Warp Blue.**

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Dyestuffs and Chemicals, Fast Colors for Cotton, Wool and Silk, Shades Matched. Full particulars on application. Nubian One-dip Fast Black for Woolens. Lion Improved Ammoniated Potash Wool Scourer, Alzarine and Hematine Mordants, Etc.

273 Congress Street, Boston, Mass.

AT LAST Union Goods and Hosiery made of Cotton and Wool in any proportion can be dyed a good serviceable Black in One Operation with the

Save Time, Labor, Steam, Trouble and Expense of Speck Dyeing.

Naumkeag One-Dip Black Dye.

Competent man sent free of expense to start you up. Address,

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Successors to Mason, Chapin & Co.

ESTABLISHED A. D. 1815.

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ALL DYESTUFFS For Printers, Bleachers, Dyers, and Manufacturers

Special attention given to Starches, Gums, and materials for starching, softening, and finishing all fabrics.

WOOL SCOURING POWDERED POTASH.

Works at DIGHTON, MASS. **Sole agents for The Mathieson Alkali Works, Saltville, Va.**

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DYEWOODS

Logwood Extracts,
Ground and Bolted Camwoods
And other Fancy Woods.

All Goods Warranted Uniform.

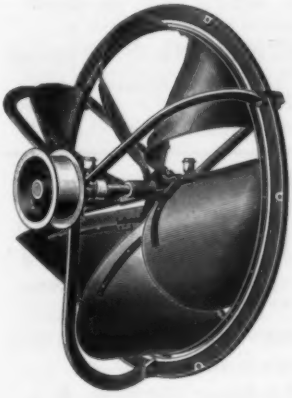
Long Distance Telephone. **UNCASVILLE, CONN.**

Value of Acetylene.

When it was first proved, says the Chicago Record, that by heating a mixture of coal or line or charcoal and chalk in an electric furnace, a compound resulted which upon being thrown into water evolved acetylene, the gas companies were naturally elated. They looked upon the new discovery as a cheap and easily procurable substance for mixing with their own product, and thus raising its illuminating power. Acetylene, however, is turning out to be an even more extraordinary substance than has been suspected. It has so many strings to its bow that its exploiters are presumably abandoning the problem of enriching gas, and are actively engaged in demonstracting that by means of it the cheaper manufacture of innumerable substances which are used in the art, but which up to the present have been the products of pure chemistry, can be achieved. The acetylene, on being passed through an iron tube heated to dull redness, turns rapidly and completely into benzine. This is a product of prime importance and is the base of thousands of organic substancess In illustration of the transmutation, which can be effected, it may be pointed out that if the resultant benzine vapor be passed into strong nitric acid, it is transformed into nitro-benzine, and this, on treatment with hydrochloric acid and iron filling, goes into aniline. With the formation of aniline the road is opened for the production of immense series of dye substances, of which aniline is the starting point.

Instead of transforming acetylene into aniline, however, it may be changed into carbolic acid; thence it is but a step to picric acid, the formation of the modern high explosives. Or it may be made into anlline and then boiled with acetic acid, when it is transformed into anti-fibrin, the well-known fever specific. Again, by passing it through a tube heated to bright redness, napthalene is produced, which is also the starting point of a legion of valuable

Continued on page 87.



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Ventilating Wheels

For drying all kinds of Material, and for removing Steam, Smoke or Gas.

This is the only Wheel manufactured that has no back draught on the delivery side.

Send for a Circular to

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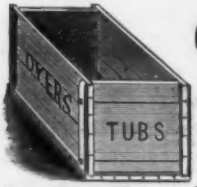

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All kinds of **VATS AND TUBS** used by Dyers, Bleachers, Mills, Factories, etc.

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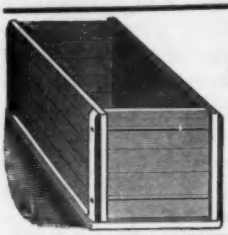

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Dye-Tubs, Water Tanks, Wash Boxes, Bleaching Tubs, Blue Vats, Boiling Keirs, etc. **RESERVOIR TANKS**, any capacity or shape, for factories, dwellings villages, farms, etc. Please send for Estimate, and we will Guaranteed Satisfaction.

Established 1788.

JOSEPH OAT AND SONS,

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Copper Dye Vats, Vacuum Pans, Steam Cylinders, Logwood Extractors,

And all kinds of copper work used in dyehouses and chemical laboratories.

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Importers and Manufacturers of

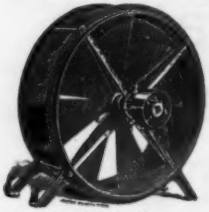
DYE STUFFS AND CHEMICALS,

145 Milk Street,

Works at Walpole, Mass. **BOSTON.**

Telephone 1580.

NEW ENGLAND



From 1 to 6 ft. in Diameter.

Ventilating and Heating Company.

Our system of Ventilating and Drying by air circulation will improve quality and increase production.

PLANS AND ESTIMATES ON APPLICATION.

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For Furnaces, Rolling Mills, Lime Kilns, Glass Works. Baker's Tile, Stove and Range Linings. Ground Brick and Fire Mortar by the barrel. Fire Clay, Sand and Kaolin by the ton or cargo. Also **CHEMICAL STONEWARE** for Manufacturing Chemists. Chemical Brick for Glover Towers. Stoneware of every description always on hand.

2637-59 E. CUMBERLAND ST., PHILADELPHIA, PA.

Continued from page 85.

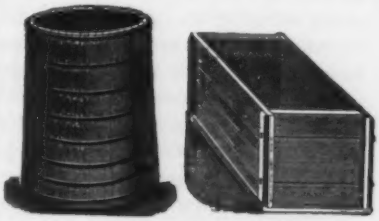
chemicals. It would seem as though almost all the needs of man were able to be satisfied by this protean substance. The further investigation is pushed into its possibilities the more astounding and bewildering they become. By the action of nascent hydrogen acetylene becomes ethyphuric acid and water becomes alcohol, which, apart from its other uses, is absolutely necessary to the production of an enormous number of economic substances. In similar ways we can get such deadly poisons as oxalic acid and prussic acid, while acetylene is a cheap source of the aldehyde so much used in the production of artificial essences and the manufacture of mirrors.

When, therefore, it is considered that from acetylene can be derived whole systems of dyes, medicines, essences, perfumes, poisons, explosives, not to mention cheap whiskey, it will be seen that the latest product of the electric furnace has a utility out of all proportion greater than that which can be derived from its peculiar light-giving powers.

—Southern California is to have a wool scouring establishment of some magnitude, which will be known as the Pacific Wool Co. California is waking up to the fact that her wool jobbers have been paying freight on from 65 to 75 per cent. of grease and dirt in the wool in the grease that they ship to the East. There is one wool scouring establishment already located in San Francisco, and we believe it is doing very well. This new one will be at Los Angeles, and will have a capacity of about 4,000,000 pounds a year, giving work to 60 or 70 people. The scouring and cleansing will be done by the most modern machinery, under the latest improved processes. Oil will be used as fuel. If all the territory wool sent to Eastern markets were sent scoured instead of in the grease, it would make quite a material change in the markets.

ESTABLISHED 1840.

GEO. J. BURKHARDT'S SONS'



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The Cypress Lumber Co.

CYPRESS TANK . . . FACTORY.

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DALE EXTRACT COMPANY,

Manufacturers of

Fustic Extracts,
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Specialties.

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AGENTS:

W. A. PRIEST, 14 Central Wharf, Boston.
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Ramie is attracting a good deal of attention lately, and an English patent for dealing with it and similar fibres is worth referring to. According to this invention the fibres are soaked for some hours in dilute nitric acid, the strength varying from a quarter per cent. to two per cent. They are then immersed in a solution of an alkaline base in order to neutralize the acid, and at the same time fix the nitrate of the base employed. They are then boiled for about two or three hours in a dilute solution of a caustic alkaline base and zinc dust, so that one of the compounds formed during the boiling will be hydroxylamine. By this treatment the ribbons are entirely deprived of their epidermis, without the fibre suffering any damage whatever. The fibre is next boiled in a weak solution of an alkaline base, such as the hydrate, for from one to two hours (the strength being from half to one per cent., according to the nature of the fibre). The fibre is then washed, preferably under pressure. The ribbons of fibre will now be found to be deprived of the lime, gum and epidermis, and will also be partially bleached. Should it be required to further bleach them, this may be done by soaking the fibre in a solution of hypochlorite of an alkaline base and hydrochloric acid, in such proportions that hypochlorous acid and not chlorine is formed. This solution must not be too strong or the cellulose will be attacked and damaged. The fibre is then well washed and dried, and is ready for slivering and spinning.

In the usual process of dyeing or printing paranitraniline red, it is necessary to use Turkey red oil in the naphthol bottom or "prepare." The inventors now find that this substance can be successfully replaced by the usual thickenings used in calico printing, but more especially by gum tragacanth or gelatine.

Seamless Cast Iron Steam Kettles,

Cast in one piece. No leaking. No boiling over. No waste of steam. Sizes 6 to 200 gallons. Send for Circular "S."

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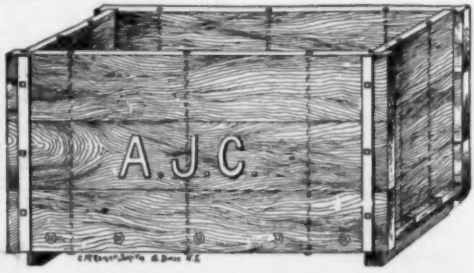
CORCORAN'S Tanks, Vats & Dye Tubs are Perfect

Of either Cedar or Oak, Pine or other woods. Bands fitted with **Adjustable Lugs** and **Draw Rods** with friction plates. Over 200 sizes. Send for information.

STORM DEFYING WIND MILLS.

Most durable, always satisfactory. They are working in every country on earth.



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Calenders, Starch Mangles, Calender R.

Bleaching AND Dyeing Ma.

Printing Machines, Shafting, Pulleys, Gearing, Hydraulic Presses, Tenter Ageing Boxes, Expansion Pulleys, Hollingworth Automatic Feed, Ca. Machines, Grate Bars, Cloth Cutting Machines, Silk, Lace and Cotton Finishing Machinery,

and Sole Manufact'rs of **NAGLE POWER FEED PUM.**

Send for Catalogue.

LINCOLN & COMPANY,

MANUFACTURERS OF IMPOVED MACHINERY FOR

Bleaching, Dyeing, Drying and Finishing.

Sole Makers for the United States of

Mather & Platt's Patent Self-feeding Tenters.

Complete Plants for

BLEACHING, ANILINE BLACKS AND INDIGOS.

54 to 70 Arch Street, - HARTFORD, CONN.

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IMPORTERS AND MAKERS OF MACHINERY FOR

Calico Printing, Bleaching, Dyeing and Finishing.

Sole makers of **WM. BIRCH'S PATENT OPEN SOAPING MACHINE.**

Our **SEWING MACHINES** are heaviest and strongest made. Will sew all kinds cotton and woolen goods, wet or dry, very finest to stitch 1 inches long. Send for circular.

SOMERVILLE, (Near Boston), **MASS.** (Fitchburg Railroad.)

COPPER PRINT ROLLERS AND SINGE PLATES

For CALICO PRINTERS and DYERS.

Best of Workmanship, Quick Delivery and Bottom Prices.

New Bedford Copper Co., New Bedford, Mass.

Copper Swing Dye Tank in Iron Frame.

COPPER WORK FOR DYERS

Silk Finishers, Chemical Works, etc,

Vacuum Pans, and Copper Apparatus for Logwood Extract Manufacturers. Jacket Kettles, Varnish Kettles.

Estimates furnished to all parts of the country.

CHAS. BRABENDER, Sen.,

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Manufacturers of

PLAIN AND AUTOMATIC CIRCULAR RIB

KNITTING MACHINERY

for Knitting Ribbed Shirts, Drawers, Tights, Combinations, Skirts, Jackets, Caps Bicycle and Athletic Suits, Hosiery, Shirt Borders, Cuffs, Etc.

Automatic Seamless Machines.

AUXILIARY MACHINES AND SUPPLIES.

606 Arch St., Philadelphia, Pa., U. S. A.

ESTIMATES GIVEN FOR THE

Complete Equipment of a Knitting Mill.

KNITTING MACHINE CYLINDERS.

PAXTON & O'NEILL,

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Originators of the Weldless Forged Steel Cylinder. Dials, and Cylinders all sizes up to 24 inch, for the different Circular Rib Frames, Seamless Knitters, etc. The Finest that can be cut, and the Best as to Material Accuracy and Durability.

H. BRINTON & CO.,

Successors to

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Builders of a Full Line of

CIRCULAR RIB and SEAMLESS KNITTING MACHINERY,

FOR

UNDERWEAR AND HOSIERY.

213 and 215 Race Street

PHILADELPHIA, PA.

Knit.

New Mills.

—GEORGIA, Athens. Work on new knitting mill will commence at once. The main structure will be 50x125 feet, and two stories high.

—GEORGIA, Maxeye. The principal parties interested in the Maxeye Mfg. Co., that we reported would establish a knitting mill here, are H. T. Brightwell, A. J. Gilling, W. T. Brightwell, Geo. R. Brightwell and T Gilling. They have filed an application for a charter of incorporation, and are investigating with the view of erecting a knitting mill in addition to their cotton gin, corn and saw mill which they erected last year.

—GEORGIA, Talbotton. Clarence Weeks intends to start a hosiery mill to employ 50 hands, in this town.

—*GEORGIA, Winder. The stockholders of the cotton mill which we some time ago reported there was a prospect of being built here, are now contemplating abandoning the cotton mill idea, and building a knitting mill instead.

—IOWA, Oscaloosa. It is reported that a factory for the manufacture of knit goods will shortly be established in this place.

—MASSACHUSETTS, Lowell. In the new mill of Otis Allen & Co., on Willie St., will soon be started a factory for the manufacture of women's underwear, by a stock company, of which Hon. Chas. Allen is a member. They will employ 100 or more hands.

—*MICHIGAN, Pontiac. The Wakeman Knitting Co. have filed articles of association with the Secretary of State.

—NEW HAMPSHIRE, Laconia. A new hosiery firm is moving into the second floor of Tetley's block, which has been finished off for them. The firm is composed of W. D. Swaine, of Methuen, Mass., and a silent partner.

—*NEW YORK, Cohoes. Plans have been made for a new knitting mill to take the place of the Westside or Glenwood Mill, which we reported destroyed by fire March 6th.

—*NEW YORK, Gloversville. At a meeting of the directors of the Gloversville Knitting Co. held March 26th, it was shown that work on the factory had so far progressed that it seemed quite probable that operations would be commenced within two weeks. The electric lighting apparatus is in working order.

—NORTH CAROLINA, Raleigh. A hosiery mill company is being organized here by W. J. Andrews and associates.

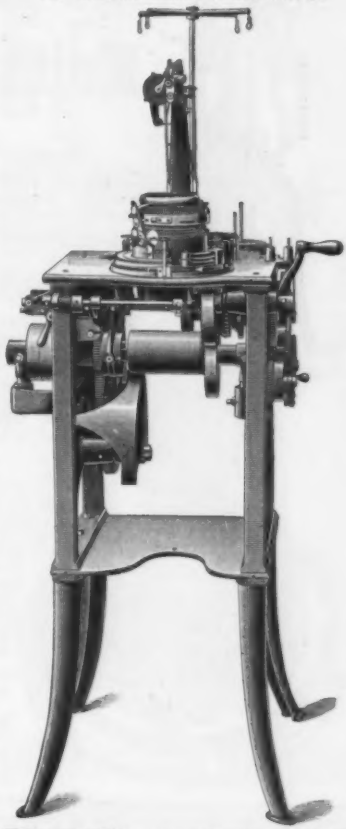
—NORTH CAROLINA, Rocky Mount. W. H. Worseley and associates are organizing a company to build a $25,000 knitting mill in this place.

—NORTH CAROLINA, Winsor. Francis D. Winston contemplates the establishment of a knitting mill, and is now making investigations as to the machinery and other equipment.

—PENNSYLVANIA, Germantown. Thomas Moore, proprietor of the Mt. Airy Knitting Mills, which was recently destroyed by fire, has been granted a permit for the building of a new mill. It is said that the new structure will be much larger than the one burned.

—*PENNSYLVANIA, Mohrsville. The new underwear factory of Fraunfelder & Wagner, which we reported as likely to start in this place, is now preparing to put in new machinery.

THE ACME AUTOMATIC KNITTER
for SEAMLESS HOSIERY.



This machine is entirely past the experimental stage.

The method of transferring tops more practical than changing cylinders.

Machine will produce anything from a short foot to the longest hose without substituting or changing any parts whatever.

Extra thread in heel does not show in instep.

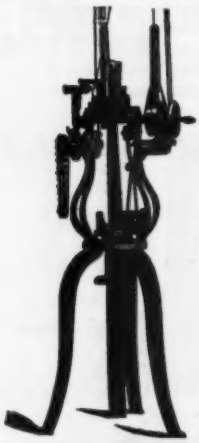
In a wool hose a cotton, merino or silk re-inforcing thread may be used as it is positively thrown in on the first course of the heel and toe and as positively taken out on the last course.

Stitch automatically loosened in heel and toe to accomodate any size of reinforcing thread.

Seam in heel and toe remarkably strong and close and heel is large and full Runs equally well on any grade of goods.

Send for Descriptive Catalogue.

MAYO KNITTING MACHINE CO.,
FRANKLIN, N. H.



Pepper Manufacturing Co.

Lakeport, N. H.,

Manufacturers of

Knitting Machinery,

INCLUDING

Pepper's Flat-Ribbed Cuff Machine,

Automatic Welt and Loose Course Machine for Sock Tops. New Circular Stripes with Welt, Loose Course and Striping (Automatic), for Shirt Cuffs, Sock Tops, Hose Legs, Wristers, etc.

GOLF AND BICYCLE STOCKING MACHINES.

All kinds of

CIRCULAR RIBBED MACHINES,

For Men's Underwear, Ladies' and Misses' Hose Legs & Legnigs.

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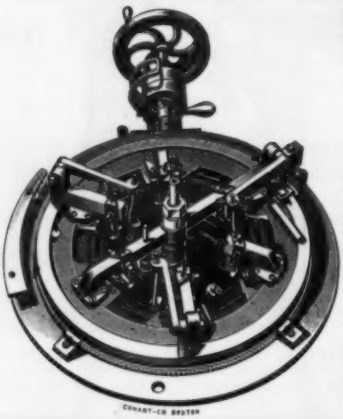

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of LATEST CONSTRUCTION

giving GREATEST PRODUCTION,

and with points of merit not to be found in any other style of machine for

SWEATERS,
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LEGGINS,
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Automatic racking or shogging; Sweater Collar Machines.

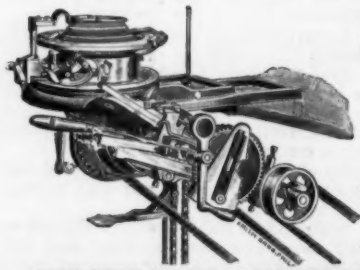
Racked or Shogged Borders onSweaters are our Specialties.

Leighton Machine Co., Manchester, N. H.

EXCELSIOR

Knitting Machine M'f'g Co.,

MANUFACTURE THE ONLY



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Knitting Machine,

With or without Fashion Device

That will stand all Factory Strain.

Address all communications for prices and samples on the 3-4 to the

EXCELSIOR KNITTING MACHINE M'F'G CO.,

Cor. Birch St. and P. & R. R. So. Bethlehem, Pa.

—PENNSYLVANIA, Newton. William Menzies, formerly connected with the Roxborough Mills Co., at Plymouth, has leased the old Smith building in this place and will start a hosiery mill, which will give employment to a goodly number of hands.

—*PENNSYLVANIA, Yorkville. Work has begun on the Reber stocking factory, which is to be erected at the corner of 14th and Market Sts.

—SOUTH CAROLINA, Bamberg. A new knitting mill company with a capital stock of $10,000 has been organized here. Committees have been appointed to secure a charter, purchase machinery, etc. A meeting will be held in a few days to elect officers. J. F. Falk and H. Eaves are the leading spirits in the enterprise.

—*SOUTH CAROLINA, Branchville. The knitting mill which we reported would be established here will be known as the A. S. Dukes, Son & Co.

—*SOUTH CAROLINA, Cheraw. Regarding the rumor that E. V. Finlayson, of Charlotte, N. C., J. C. Whitley, H. D. and Burness Finlayson, of Cheraw, would build a new mill at Charleston, S. C., we are officially informed that the mill will be built in Cheraw, and will be known as the Finlayson Knitting Mills.

—*SOUTH CAROLINA, Jonesville. The Jonesville Knitting Mill, the progress of which we have reported from time to time, is now nearing completion. The engine and boiler are being put in place and there is a good prospect of the mill being in running order by the 15th of June.

—SOUTH CAROLINA, Sumter. A movement has been started here for the erection of a knitting mill, and subscription books, we are informed, are now being circulated.

—*TENNESSEE, Chattanooga. Concerning the stock company which we reported as being formed here for the purpose of manufacturing knit underwear, we are now informed that Carswell & Carswell is the firm that is interested in this enterprise, and that they now wish to obtain estimates on the cost of different sized plants.

—VIRGINIA, Lynchburg. We have a report that Samuel Bransford will endeavor to organize a company with the purpose in view of establishing a hosiery mill at this place.

—*VIRGINIA, Richmond. E. O. McCabe, who has been contemplating the establishment of a knitting mill, has concluded to drop the matter for the present.

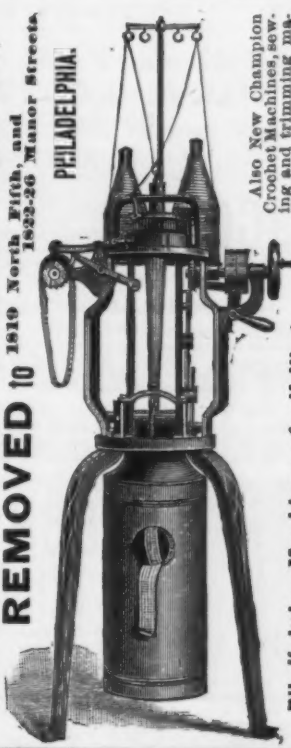
—WISCONSIN, Prentice. John Dixon, of Eau Claire, has made a proposition to the citizens of Prentice, looking to the establishment of a knitting factory which will employ from 100 to 200 hands.

Enlargements and Improvements.

—CONNECTICUT, Plainville. The Plainville Manufacturing Co. has awarded the contract for an addition to their store house on Pierce St. The addition will be about 30 feet in length, of brick, and of the same size and appearance as the present building. The fence bordering on Pierce St. will be removed and the new building will be extended to the line of the sidewalk on Main St. The company manufactures white merino, cotton and all-wool knit underwear.

—ILLINOIS, Kansas. Owens & Wilhoit are now the sole owners of the machinery pertaining to the knitting factory plant, having recently made the purchase from the Building & Loan Co. We are informed that they expect to add quite an amount of improved

CHAMPION SEWING MACHINE COMPANY,
REMOVED TO 1519 North Fifth, and 1522-26 Manor Streets
PHILADELPHIA.

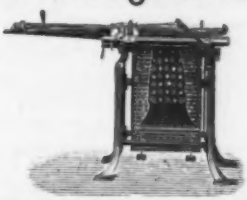


Also New Champion Crochet Machines, sewing and trimming machines, etc. Send for descriptions.

Rib Knitting Machines of all Kinds.

Grosser's Unrivalled

Flat Knitting Machines



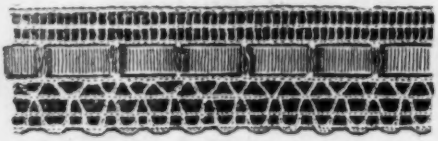
For Scotch Fancy Pattern Golf or Bicycle Stockings, Fancy Sweaters, Gloves, Mittens, Caps, Cardigan Jackets, Ladies' Skirts, etc. Seamless Shaker Sweaters (both armholes automatic, selvedge open), Theatrical and Athletic Tights. Four section full automatic power sweater machine. Four section full automatic, full-fashioned sleeve machines with automatic widening of the fabric.
SPECIALTY. Regular plain hand sweater machine, 5 needles to inch, 18 inch needle bed, with 182 needles, new improved drop-lock and two yarn carriers, front and back, for the selvedge edge, laced front and two-color striping attachment, only **$98.00** net cash.

A. MUELLER.

U. S. BRANCH OFFICE AND SHOWROOM:
760 LEXINGTON AVENVE, - BROOKLYN, N. Y
Write for Descriptive Catalogue.

PERSEVERANCE MILLS.

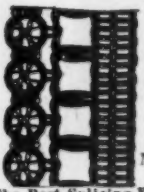
Krout & Fite Man'f'g Co., MANUFACTURERS OF
SILK AND COTTON NARROW FABRICS,
Spring, 1897, Samples Now Ready.

Lace  Edgings

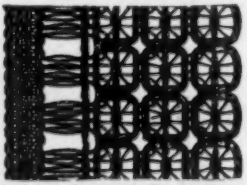
FOR LADIES' JERSEY RIBBED UNDERWEAR.
Spool Tapes a Specialty. 2632-40 Mascher Street, Philadelphia, Pa.

FLEMING & CHAPIN,

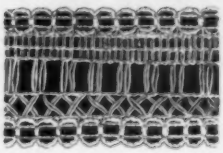
Braids Cotton and Worsted Tapes Cotton and Silk Yarns Cotton Warps, Etc. Threads



Use the Genuine Patented
CROCHET LACE EDGINGS.
Manufactured under letters-patent granted December, 1894.



The Best Splicing Yarns in all Numbers.
215 Church St., Philadelphia, Pa.



GERMANTOWN
LACE AND EDGING WORKS.
F. A. BYRAM,
Cumberland Street, Philadelphia, Germantown, Pa.
FLEMING & CHAPIN, 215 Church St., Selling Agents.

GIBBONS FRAME
Sewing Machines, with or without Trimmers.
SPECIAL FEATURES:
Welting Machines, Finishing Machines, Machines for Sewing Wet Goods, Machines for Double Heel Work, Machines with Concealed Stitch for Tops of Stockings, Etc., Etc. Tables and Shafting with Transmitters.
All machines have Ball and Socket Bearings, with Hardened and Ground Working Parts.
MACHINE JOBBING.
Manufactory, Second and Diamond Sts , Philadelphia.

SHIRT Border Machines

Four and Five Section Flat Cuff Machines.

machinery, and start up the plant on a larger scale than ever. They manufacture cotton, wool and lisle hose and half hose.

—MASSACHUSETTS, Highlandville. Wm. Roper, knit goods manufacturer, is building an extensive addition to his works.

—NEW YORK, Utica. The Imperial Knitting Co. has decided to place new machinery in its works.

—VIRGINIA, Norfolk. The Chicora Knitting Mills contemplate an increase in their plant to double its present capacity, a little later on.

Mills Starting Up.

—NEW HAMPSHIRE, Laconia. The Halifax Hosiery Mills, which were recently sold at auction, have started up with a small force, which will be increased soon. These mills have not been running since Dec. last.

—NEW YORK, Cohoes. The Royal Knitting Mill has started up on full time. This mill shut down in December last.

—NEW YORK, Kingston. After being shut down for over two months, the knitting mill on Hasbrouch Ave. will be open for business immediately. It will be under a new management. The old co-partnership existing between W. P. Harvey and wife and James W. Lasher has been dissolved. Mr. Lasher has purchased the interest of Mr. Harvey and wife. The old name of the Lee Manufacturing Co. will be changed to the Cornell Knitting Co. The former name of the Lee Manufacturing Co. will be used by Mr. Harvey, who will open a knitting mill at Esperance. It is said in the near future, new machinery will be placed in the Cornell Knitting Co.'s works.

—NEW YORK, Northville. R. O. Hagadon's knitting mill has been leased for a term of years by E. L. Potter, J. S. Faulkner, and A. E. Crager. In the future the mill will be known as the Northville Knitting Mills. This mill has recently been equipped with new and improved machinery, and is now being started up.

—NEW YORK, Troy. There is some prospect of the Wynantskill Knitting Co.'s mills at Albia being started up. A line of samples of woolen goods have been sent out by the company, and on the number of orders which come in will depend the starting of the mill. These mills have been shut down for some time.

—The Cedartown Cotton Mfg. Co., Cedartown, Ga., are now receiving shipments of machinery for their new equipment. The picking machinery, revolving flat cards and electric stop motion drawing frames will be built by the American Machine Co., of Pawtucket. The slubbing, intermediate and roving frames have been ordered with Howard & Bullough, through C. E. Riley & Co., Boston. The spinning frames will be built by the Fall River Machine Co.

—The Stamford Mfg. Co., which has since 1844 occupied quarters at 157 Maiden Lane, New York, on May 1st removed to more commodious quarters at Nos. 133 35-37 Front St. Fifty-two years at one address is a long record in American business history. The Stamford Mfg. Co. has kept thoroughly in pace with the times, and the change of location has been necessitated by the inadequate room and facilities at their old location.

—Suit has been brought at Concord, N. H. by H. W. Church against the Wm. White Machine Co., of Nashua, on the alleged infringement by the latter company of patent rights for washing machine. The Church Machine, is built by the Kitson Machine Co., Lowell.

THOMAS KENNEDY,
Successor to N. H. BRUCE,
Established 1872,
COHOES, N. Y.
SPECIAL MACHINERY
for Knitting Mills, Collar and Corset Factories.
CLOTH CUTTERS—Power and Hand.
FOLDING, WINDING AND CUTTING machines, automatic.
POWER NECK MARKERS.
RIB CUTTERS.
Irregular Form
CUTTING MACHINERY
for Cloth, Knit Fabrics, etc.
Write for Catalogue.

CRANE MFG. CO.
LAKEPORT, N. H.
Spring Needle Circular Knitting Machine
For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

The BALLOU
Automatic Ribbed Knitting Machine
Built with **Sectional Cam Ring** and the most perfect **weight take-up**. Best, Strongest and Most Durable Machine. **Two Feed Double Knee Machines.** We can add to our own or other makes now in use. Also Brushing Machines.
Lewis Jones, 60½ & Media Sts. Phila. Pa.

WE NEED NO SPECIAL POINT
To prevent the needle from picking up the brass, nor special mechanism to prevent injury to the brass, for the needle in our looper never strikes anywhere but the centre of the point.
HEPWORTH & CO.,
Lehigh Ave. & Mascher Sts., Phila., Pa.

HODGSON & HOLT MFG. CO.,
Builders of the
Abel Winder, Steam Presses,
Fulling Mills, Seamers and Loopers, Ribb Leggers, and French Footers.
Send for Illustrated Catalogue.... LACONIA, N. H.

THOS. COCKER & CO.,
BRUSH MANUFACTURERS.
We make all kinds of MILL BRUSHES either and or machine. Brushes for FINISHING WORKS for WORSTED MANUFACTUERRS a specialty.
151 North 4th Stree' - PHILADELPHIA, PA

STEPHEN A. ASHMAN,
Forged Steel Cylinders and Dials
For Knitting Machinery.
3 Fetter Lane, PHILADELPHIA.

The Unique

FULL AUTOMATIC

SEAMLESS KNITTER

Any kind of stock can be used.

Transfer device most practical.

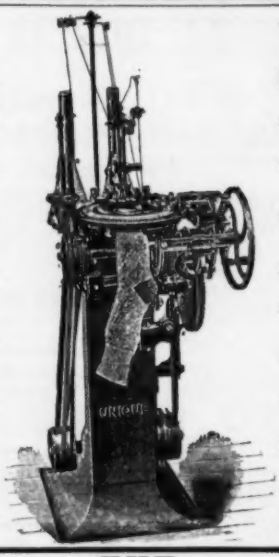
No delicate parts. Simple construction.

Needles all alike and inexpensive.

No sliding sinkers to wear out.

No weights required.

JAMES TAYLOR,
Sole Selling Agent.



THE BEST MACHINE
ever invented for
Knitting Wool Stockings.

The best fabric.

Changes yarn in the heel and toe automatically.

Well built, strong and durable.

High grade.

Light running.

No cylinder to give trouble.

Machine easily managed.

Most liberal heels.

835 Arch Street,
PHILADELPHIA, PA.

THE
Merrow High Speed Crochet
and Scallop or Shell Machines.

For finishing the edges of Knit Goods, Bed Blankets, Horse Blankets, or other fabrics.

For particulars and samples, address

THE MERROW MACHINE CO.,
133 Sheldon St., HARTFORD, CONN

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS. T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA.

CIRCULAR RIB KNITTING MACHINES,

Carefully designed and well made with Solid Forged Steel Cylinders and Dials, Segmental Cam Rings, Encased Take-up, Stop Motions, etc. Standard Sizes, Reasonable Prices. Also

KNITTING MACHINE CYLINDERS AND DIALS.

STAFFORD & BABCOCK, - Little Falls, N. Y.

Abreast With the Times.

The Globe Yarn Mills, of Fall River, of which Arnold B. Sanford is treasurer, has always been known throughout the trade as one of the best equipped and managed yarn mills in the country. Starting in 1881 with their present No. 1 mill, mills No. 2 and No. 3 have subsequently been built to supply the demand for their product, and their total capacity is now 100,000 spindles, with a weekly product of 120,000 pounds of cotton yarns, ranging from 14s to 160s.

The policy of this mill has always been to keep its equipment and the quality of its production up to the highest standard, and the result has been that they have been enabled to meet the market and competition under varying conditions. At the present time the mills are quite busy and marketing their production, but of course with low margins of profit.

Numerous changes in the line of improvement have been made during the past year, principally in mill No. 1. The picker room has been remodelled, and new machinery placed, from the Kitson Machine Co. In the carding room 50 Ashworth latest pattern carding engines have been put in, as well as 24 combers and lapping machines from Dobson & Barlow, with some roving machinery from Howard & Bullough.

The mules in No. 1 mill have been displaced by ring spinning, by changing about 7000 spindles of mules for frames. They are now changing the old Rabbeth spindles on the frames, and putting in Draper's No. 2 pattern. These changes will put No. 1 mill in splendid condition.

In No. 3 mill, 36 ring frames are being taken out and transferred to mill No. 1. Their place is being taken by new hosiery mules from the Mason Machine Works, of Taunton. They have also added some Foster cone winders from the Foster Machine Co., in the No. 3 mill, and have added more or less twisters during the past year to mill No. 2. They now have a very large twisting room, about 30,000 spindles in one room.

The facilities of the Globe Yarn Mills are unsurpassed for all varieties of cotton yarns, carded or combed, and put up in any form demanded by different branches of the trade.

Hosiery and Golf Yarns.

George Shimer & Boyer, Phila., are supplying the trade just now with especially acceptable hosiery and golf yarns in wool and worsted. Their Camden mills are operating steadily on these specialties. The firm also carry a full line of bundle yarns for the jobbing trade at their warehouse, 516 Market St., Phila., which is their main office.

Worsted Yarns.

Attention is directed to the card elsewhere, of the Trenton Worsted Mills, Trenton, N. J. The mills are old and well-known producers of worsted yarn in all numbers, a specialty being knitting and floss yarns. Superintendent A. Foster informs us that their mills are thoroughly equipped, and that orders from various sections keep them steadily in operation.

—The Lonsdale Co., Lonsdale, R. I., have placed their entire order for picking machinery, revolving flat cards, electric stop motion drawing frames, slubbing, intermediate, roving and jack frames for their Ashton mill with the American Machine Co., of Pawtucket, R. I.

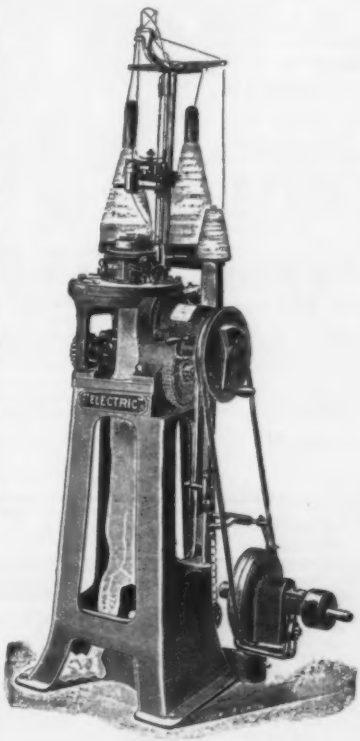
—Flyers, presses and mule spindles, as made by one of the best makers in England, can be obtained from Arthur L. Jacobs & Co., Boston.

E. Jenckes Man'f'g Co.,

75 WEEDEN STREET,

PAWTUCKET, R. I.

Proprietors and Builders of



"ELECTRIC"

AUTOMATIC KNITTING MACHINE,

FOR

Seamless Hosiery, Wool, Cotton or Silk,

From the Coarsest to the Finest Gauge.

Among the many strong claims for this machine are

The Highest Speed,
First Quality Work,
Simple Construction,
Easy to Learn

Send for Descriptive Circular and Terms

The acknowledged **PIONEER** among Ravelers and Trimmers is

THE "CHAMPLIN."

Patented Feb. 18, 1890.

Guaranteed Free from Infringement.

Works perfectly on the very finest BALBRIGGAN and EGYPTIAN WORK, or Wool Work of any Gauge.

A Primary Invention protected by a Pioneer Patent.

Manufactured Exclusively by the

UNION RAVELER COMPANY,

469 River Street, EUGENE H. BROWN, Pres. **TROY, N. Y.**

ATTENTION IS CALLED TO THE FOLLOWING DECISION.

U. S. Circuit Court of Appeals. Second Circuit.
Adelbert L. Traver, Appellee, vs.
Eugene H. Brown, Appellant.

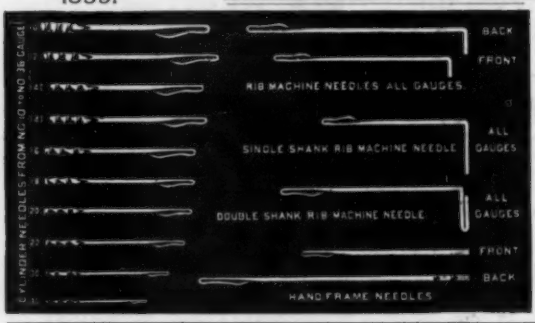
"WALLACE, CIRCUIT JUDGE." "We are unable to doubt that the machines of the appellant do not infringe the claims in controversy.

"Accordingly the decree of the Circuit Court should be reversed, with costs against the appellee, (Traver) and the cause remanded to the Circuit Court, with instructions to dismiss the bill, with costs of that court." 70 Fed. Rep. 810.

Production Points: — Increased 8 dozen per day on each Looper; fewer parts and all interchangeable; runs longer without attention, and better built. It is for your interest to try your figures on the increased production for one year's time, and see what manufacturers are saving by the use of this machine TRIAL GIVEN FREE OF CHARGE.

ESTABLISHED 1859.

CHARLES COOPER,



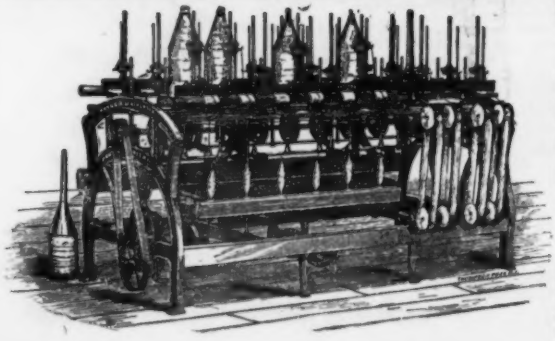
BENNINGTON, VERMONT.

Manufacturer of

Spring Knitting Needles

of all Kinds, Looper Points, Etc

The Oldest Spring Needle Manufacturer in the United States.



GEO. W. PAYNE & CO.,

PAWTUCKET, R. I.

WINDERS for Hosiery Manufacturers. Wind from cop, skein or bobbin.

Improved Upright Spoolers

Doubling Spoolers,

Quillers, Etc.

We make a complete line of this machinery, and have hundreds of machines in satisfactory operation all over the country. We invite correspondence.

Hosiery and Knit Goods Directory.

For the fourteenth time the "American Directory of the Hosiery and Knit Goods Manufacturers of the United States and Canada," published by the Textile Record, has made its appearance. The edition for 1896 has been carefully revised. Besides directory information, the book contains several pages of tables of special interest to manufacturers. The price of the work is $2, and it can be obtained from Frank L. Nagle, manager of the Boston office, Room 14, 299 Devonshire Street.

Thomas Townsend Moves.

In the face of frequent reports of extra dull business and falling off in trade, it is a pleasure to note a circumstance in quite a contrary direction. Thomas Townsend, who since 1885 has been established under the present firm name and that of its predecessors, Hood & Townsend, at Manchester, Ct., finds that his business has increased to such an extent that the present quarters at Manchester are wholly inadequate, consequently on and after April, 1896, business will be carried on at 157 Orange St., Providence, R. I. In his new location he will have largely increased facilities, more room, and every convenience for executing his orders promptly. The past eleven years a very substantial business has been built up in the line of his specialties, and on making this important change in location, he takes this occasion to thank his numerous patrons for their past favors, and solicits continuance.

Mr. Townsend is an expert manufacturer of machine wool combs, hackles, gills, fallers, and porcupines for flax, jute, tow, wool and silk, tentering pin plates and silk dressing frame combs. He also does a great deal of work in the line of re-needling cotton combs, and carries a full line of the best English and American cast steel pins and comber needles.

There are only a few concerns in this line of business, which demands practical knowledge and expert experience. These qualifications are possessed by Mr. Townsend in a marked degree, which accounts for the substantial growth of his business.

Textile Machinery.

The card of the Textile Machine Works, of Reading, Pa., may be found elsewhere in this issue. The proprietors are Thun & Janssen, both of whom are active workers and practical machinists. They are well known for the excellence of their particular productions, and their business record has been one of steady growth. At an early day they will occupy a new mill of their own building, constructed with all modern appliances and furnishing greatly increased manufacturing facilities. The specialties of the firm are braiding machines, hacking braiders, machines for covering electrical wires and cables, gimp machines, spooling and doubling machines, etc.

—Arthur L. Jacobs & Co., Boston, report having sold several of the new Foster quill winders in April, just because of the hard times. The quills wound in this form effect a marked saving in weaving expense. Messrs. Jacobs & Co. advise us that they will be very glad to show frames in operation, wind samples, etc.

—The Hope Mills Mfg. Co., of Hope Mills, N. C., have placed an order for revolving flat cards with the Pettee Machine Works, Newton Upper Falls, Mass.

WM. COREY CO.,
Manufacturers of Knitting Machine
Latch Needles,
MANCHESTER, N. H.

Excelsior NEEDLES
The best hosiery needle in the market.
Manufactured by
Wardwell Needle Co., Lakeport, N. H.

LOYAL T. IVES,
MANUFACTURER OF ALL KINDS OF
Spring Knitting Needles
NEW BRUNSWICK, N. J.

ORION TREAT,
MANUFACTURER OF
SCREW RIVETED BALMORAL AND DOUBLE RIB NEEDLES.
(Patented May 6. 1890.)
Manchester Green, - - Conn
All work guaranteed.

H. LYDALL & FOULDS,
Manufacturers of all kinds of
Knitting Machine Needles, Narrowing Points, Hooks, etc.
Pat. Screw Rivet Balmoral Needles a specialty
MANCHESTER, CONN.

Wm. Breedon & Son,
Manufacturers of
Spring Knitting Needles,
And Burr Blades of all kinds.
Amsterdam, N. Y.

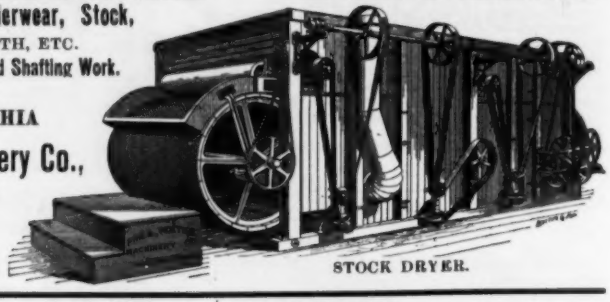
STAR NEEDLE CO.
Spring Knitting Needles and Points from the Best Cast Steel. Satisfaction Guaranteed.
S. K. Paramore Manager.
New Britain, Conn.

STANTON & LEWIS,
Central Steam Forge
Knitting Machine Cylinders and Dials.
316 and 318 BRANCH ST.,
PHILADELPHIA, - PA.

CYCLONE DRYERS

For Stockings, Underwear, Stock,
YARNS, CLOTH, ETC.
Textile Machinery and Shafting Work.

PHILADELPHIA
Textile Machinery Co.,
Hancock Street
above
Lehigh Ave.,
PHILADELPHIA, PA.



STOCK DRYER.

JOHN S. PALMER,
Manufacturer of
PAPER BOXES for Hosiery and Textile Goods.
Metal Edge Boxes or Heavy Goods.
35 Wistar St., Germantown, Pa.

LACINGS For Overshirts and Underwear,
Both Tipped and Tasseled, and
OVERSHIRT NOVELTIES.
For Samples and other information, address
HEPNER & HORWITZ, 30 Howard St., N. Y.

SOAP COMPOUNDS. For use in TEXTILE MILLS, Hotels, Institutions and Railroads. More economical than Soap. Clean, pure and harmless to paint, wood work, varnish and the finest fabrics.

DEAN & SUTHERLAND, Office and Warehouse 240 Chestnut St., PHILADELPHIA, PA.

Unsurpassed for the SCOURING OF WOOL.

Philadelphia Textile School

OF THE

Pennsylvania Museum and School of Industrial Art.

The only school in America which TEACHES THE DESIGNING AND MANUFACTURE OF ALL CLASSES OF TEXTILES.

Carding, Spinning and Finishing,
Chemistry and Dyeing.

pplications should be sent in at once for the term beginning October 1st, 1895. For circulars and other particulars, address,

E. W. FRANCE, Director,

Broad and Pine Streets, - Philadelphia, Pa.

What Technical Schools Have Done for Saxony.

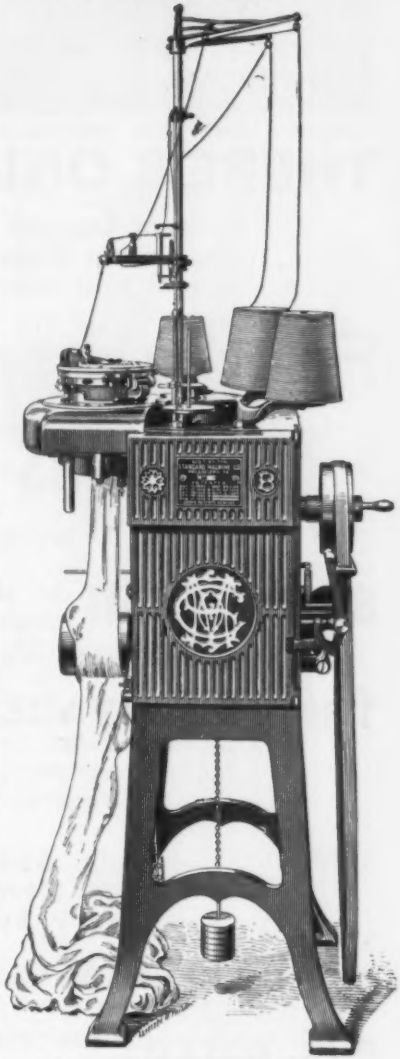
From 1879, protected by tariffs, and remembering her neglect of opportunities from 1847 to 1865, Saxony prepared for the future. She opened technical schools in every manufacturing town or city, places of not more than 5000 inhabitants having industrial schools.

Limbach, a great centre for hosiery and underwear, has an industrial school, the first of its kind in the world. Besides the industries of Limbach, the Alpha and Omega of knitting and weaving machines was and is taught. Down stairs in a large room are knitting machines of all kinds. These are run by the scholars under the eyes of their teachers. What is made is exhibited, and then turned over to the scholar who made it. Every movement of the machine is analyzed, from the simplest to the most intricate. The causes of accidents, bad work, etc., are all pointed out and explained, besides the study of gearing, belts, etc., or the thousand and one things that come up in the course of a year's work. The principal and his assistants are all most devoted to their work. The course is of two kinds, theoretical and practical, and scholars learn both.

By means of these schools, Saxony has driven England not only out of Germany, but out of many houses in New York and South America. The English machines in her mills have been rapidly replaced by machines made at home. To-day in Saxony, a kingdom with 3,000,000 people, there are 1,243,905 spindles spinning cotton yarns—more than Bavaria has (Bavaria spun the first cotton yarn that was spun in Germany), and almost as many as there are in Prussia. The average number in each mill now is 19,609, while in England the average is 29,506. Since 1887 the increase in spindles has been more than 20 per cent.

These triumphs Germany owes to her technical schools. Without them she

"STANDARD B"



COTTON STATES AND INTERNATIONAL EXPOSITION.

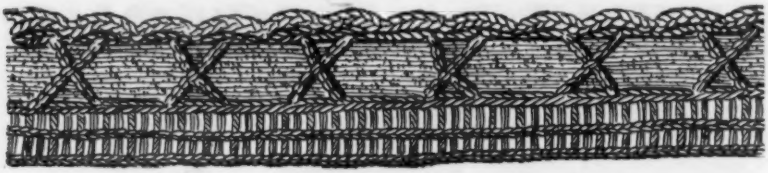
ATLANTA, GA., November 1st, 1895.

This certifies that the Appropriate Jury has awarded to the STANDARD MACHINE CO., of Philadelphia, Pa., Diploma of Honor and GOLD MEDAL—Automatic Knitting Machinery.

DANIEL C. GILMAN,
President Jury of Awards.

C. A. COLLIER,
President and General Director.

STANDARD MACHINE CO.
508 Minor Street,
PHILADELPHIA, - PA.



THERE'S ONLY ONE

Line of Edgings and Braids that **CANNOT** be bought from **NON-DESCRIPT** selling agents and others, and that is

Friedberger's WHOSE STANDARD

EDGINGS AND BRAIDS,

Universally conceded to be

SUPERIOR to all other makes, can be purchased **ONLY** direct from the mill or from his travelling salesmen.

THE ADVANTAGES of direct dealing in this line need not be pointed out to the Ribbed Underwear Manufacturer. He has already had the reverse experience.

Spring 1897 line of **SURE WINNERS,** embracing **Radically New Features,** and 150 new Styles ready **April 15th.**

OUTPUT EXCEEDS that of all other Mills combined.

OUR CREED! **New, Correct and Original Patterns, Lowest Prices consistent with Quality, Rapid Deliveries of Unlimited Quantities.**

Plant large enough for all requirements.

WEEKLY PRODUCTION, - 1,800,000 YARDS.

Write to **FRIEDBERGER** for Samples.

GERMANTOWN, - PHILADELPHIA.

had never been able to get up. Take them away, and she goes to pieces. A manufacturer said, only a short time ago, "Let the government take its hand from behind the schools, and we manufacturers will support them. They are indispensable in helping us to keep what we have, and in enabling us to go out and get more."—[Textile Mercury.

Coal Tar Colors.

It is well known that most coal tar colors are charged with adulterants. It is hardly the manufacturer's fault, but rather the "cutting" spirit of the times. The microscope, however, quickly reveals the fact that a filler is present in the dyestuff. In estimating the character and extent of any suspected adulteration of colors, both the water and the ash should be taken into account. The approximate quantity of water contained can be gauged by simply heating a given quantity of a sample in an ordinary drying oven to a temperature of 160° C.; water of crystallization (which is present in some coloring matters) is also given off at this heat, and should be subtracted from the total to obtain the actual percentage of moisture.

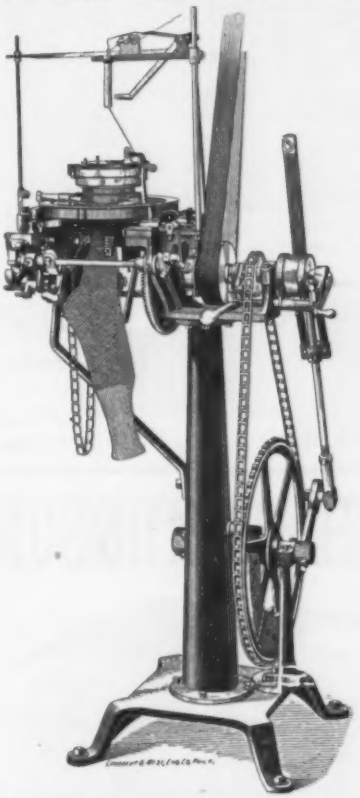
Organic impurities can generally be detected by dissolving a small sample of color in water and withdrawing the coloring matter from the solution by means of wool or silk. Upon evaporation of the residue, the impurities which have remained in solution, will be at once detected and can be subjected to a separate scrutiny. As is well known, dextrine is one of the most important adulterants in aniline colors; occasionally even gum arabic is employed. In testing colors soluble in spirit for the presence of dextrine, rapid exhaustion by strong alcohol should be resorted to; subsequently, the residue should be dissolved in water and reprecipitated with alcohol.

AUTOMATIC

SEAMLESS KNITTER

For making Seamless Hosiery of all Grades.

BEST QUALITY FABRIC.
LARGEST PRODUCTION.
SMALLEST COST FOR LABOR.



Plain and Automatic Machinery

For Knitting Ribbed Shirts, Drawers, Combination Suits, Skirts, Tights, Shirt Borders, Cuffs, Sleeves, Tops for Half-Hose, Hosiery, Etc.

ALL OUR MACHINERY GUARANTEED IN EVERY PARTICULAR.

NATIONAL

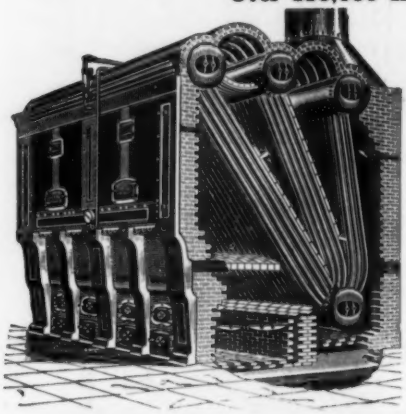
Automatic Knitter Co.,

724, 726 and 728 Cherry St.,

PHILADELPHIA.

THE "STIRLING" WATER TUBE STEAM BOILER.

Over 350,000 H. P. in use.



Absolutely safe at high pressure. Not an ounce of cast metal used in its construction. WE CAN PROVE to your entire satisfaction that the "Stirling" will give much higher average economy, with far less expense for repairs, than any boiler on the market to-day, and in proof of our claims we can refer you to some of the largest firms in the Country Please do us the favor to investigate before purchasing elsewhere.

Prices very reasonable. Catalogues, testimonials and complete information promptly furnished.

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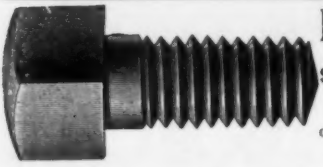
8 OLIVER STREET,
BOSTON, MASS.



Philadelphia Machine Screw Works,
Manufacturers of
SPECIAL
MACHINE SCREWS AND STUDS
of Every Description.....
Nos. 624-626 Race Street, - Philadelphia, Pa.

CHAS. MUNSON BELTING CO.,

STORE AND FACTORY:

116 and 118 North Fourth St.,

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MANUFACTURE

PURE CHESTNUT OAK

LEATHER BELTS.

SHORTEST LAP BELT MADE.

We guarantee our Belts to give better satisfaction than all other makes

ALL BELTS GUARANTEED.

Represented in all **Principal Cities in the United States.**

Long Distance Telephone, 62-94.

Watchmen in Mills.

In his monthly report for February, President Edward Atkinson, of Boston Manufacturers' Mutual Fire Insurance Co., makes the following pertinent suggestions:

"We urgently commend to our members a system of appointing watchmen and establishing the system for night watching, to which attention has lately been called by Mr. C. F. Simonson, general inspector of the Hartford Fire Insurance Co., in an address to underwriters. It is as follows:

"Select two men capable and fit to be watchmen, sweepers or helpers; let one begin his shop work at noon; when the factory closes at night, he takes a round until satisfied that everything is all right and in proper shape, then eats his supper, which he carries with him, and enters into his regular rounds of watching. He watches until 11.30, reaching home before midnight. The second man relieves him at that time, and watches until 6 A. M., when he eats his breakfast, starts the fire and opens the factory for employees at 7. Having had breakfast and the factory open, he is ready to go to his shop work until noon, when he goes home and returns at 11.30 that night. In this way the expense would be no greater than employing a sweeper or helper during the day, and a watchman at night, and each would have one-half day and one-half night at home. It is plain to anyone that a man with these hours at home could get the requisite amount of sleep. Change about could be had each week, so that the man who had the first half of the night to watch one week could have the second half the next week, and *vice versa*.'

"This is but a recognition of the system of watching the Lowell factories devised, and established by their late engineer, Mr. J. B. Francis, under whose supervision the admirable record

OPERATE YOUR MILLS

BY

ELECTRICITY.

First Cost Not Great.
Cost of Maintenance Low.
Great Economy in Operation.
Results Satisfactory.

WATER POWERS UTILIZED

NO MATTER HOW FAR FROM YOUR MILL,
BY OUR SYSTEM OF

TRANSMISSION OF POWER.

Write for Particulars and Estimates,

General Electric Company,

Main Office: SCHENECTADY, N. Y.

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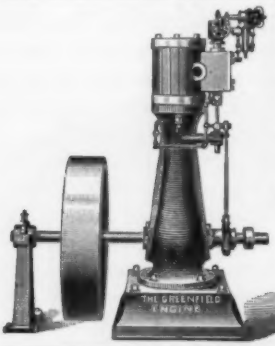

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STEAM ENGINE WORKS,

Established 1874.

Manufacturers of

Greenfield Stationary, Portable and Yacht

ENGINES and BOILERS.

Also Horizontal, Automatic and Variable Cut-Off Engines

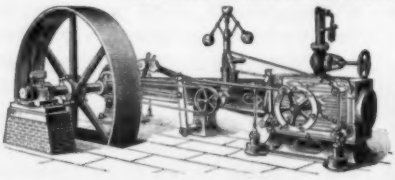
Sizes from 3 to 75 Horse Power.

Also Vertical and Horizontal and Marine Boilers. Steam Pumps and Adams' Grate Bars.

W. G. & G. GREENFIELD, East Newark, N. J.

Newburgh Ice Machine & Engine Co.,

Successors to WHITEHILL ENGINE & PICTET ICE MACHINE CO.



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Manufacturers of

WHITEHILL . . . CORLISS STEAM ENGINES, Simple or Compound for any duty.

PENNEY'S ICE MAKING AND REFRIGERATING MACHINERY, using ammonia and PICTET sulphurous oxide system.

New York Office, 39-41 CORTLANDT ST. Room 22.

Steam Boilers and Steam Power Equipments, Iron and Brass Castings.

Send for our Descriptive Circulars.

BEAR POLAR BRAND

Polar Belt Dressing.

THE BEST IN USE.

Put up in 25, 50, 75 and 100 lb. cans, One-half barrels and barrels.

Composition Wire Belt Lace.

It will not cut the belt or tear out at the lace holes.

For circulars and prices address,

GEO. W. SOUTHWICK & CO,. Stamford, Conn., Sole Manufacturers.

PL

DIXON'S PERFECT LUBRICATING GRAPHITE.

The most Marvelous Lubricant Known.
Used Dry, or Mixed with Water, Oil or Grease.

NOT AFFECTED BY HEAT, COLD, STEAM OR ACIDS.

An Interesting and Instructive Pamphlet will be sent Free of Charge.

JOS. DIXON CRUCIBLE CO. Jersey City, N. J.

TRADE **IMPERIAL** MARK.

ESTABLISHED 1876.

BOILER COMPOUNDS

For the Prevention and Removal of Scale in Steam Boilers.

Please mail us specimen of your Boiler Scale, which we will analyze for you FREE OF CHARGE, and prepare a compound for your special case, and guarantee satisfactory results. Send us a postal card and we will call.

IMPERIAL CHEMICAL CO.,

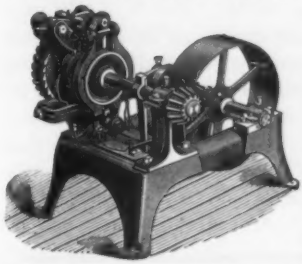
OFFICE AND LABORATORY, - 324 ST. JOHN STREET, PHILADELPHIA, PA.

BURNHAM'S New Improved Standard ...TURBINE...

It gives on either a Vertical or Horizontal Shaft more power for its price, yields a greater percentage for water used, either with full or part gate drawn, and is the simplest, most durable and best finished wheel made. Send for new catalogue.

BURNHAM BROS., York, Pa.

WATER-POWER



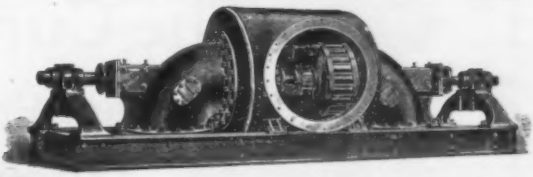
Governed for Textile Mills and Electrical Work

The limit of government of water-power is often determined by the design and construction of plant. Consult us i possible before completing your plans.

With **OUR COMPOUND REGULATORS** we will undertake and **guarantee** the government of water power **for all purposes**, including **Electric Railway, Power and Lighting Plants.** We make and sell all of Replogle's Electrical and Mechanical Governors and other devices for the government of water-power. Expert advice furnished on application. If results of your present system are not satisfactory write us. Address all inquiries to

THE REPLOGLE GOVERNOR WORKS,

MARK A. REPLOGLE, Chief Engineer. **AKRON, OHIO.**



Alcott's High Duty Turbine.

This Wheel is considered one of the most correct that has been devised; gives high results, and with late improvements is the

BEST, MOST PRACTICAL AND EFFICIENT PARTIAL GATE WHEEL IN EXISTENCE.

State your requirements and send for Catalogue to

T. C. Alcott & Son, Mt. Holly, N. J.

WATER WHEELS

MANY SIZES AND STYLES. UPRIGHT AND HORIZONTAL,

adapted to all **POWER PLANTS** for all purposes. Easy working balanced gates. We guarantee most power with smallest quantity of water, at both full and part gates.

ENGINES AND BOILERS

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Write for pamphlet of either, stating your wants.

JAMES LEFFEL & CO., Springfield, Ohio, U. S. A

LORD'S BOILER COMPOUNDS.

For the Removal and Prevention of Scale in Steam Boilers,

are endorsed by the acknowledged authorities of the world; they are adopted by the United States and Foreign Governments, and are highly recommended in our standard books on Steam Engineering. To prove this statement, I will send one of these valuable books, costing from $1.00 to $5 00 per copy, by mail, free of charge, with an order for the Compound. As I manufacture all my different chemicals, I can sell at less than half the price charged by other parties in my line.
For full information, address,

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What Steam Coal Do You Use?

For the purpose of introducing its Steam and Gas Coals to the manufacturers of New England, the Dominion Coal Company (Limited), is prepared to quote prices that will prove satisfactory to consumers.

ADDRESS:

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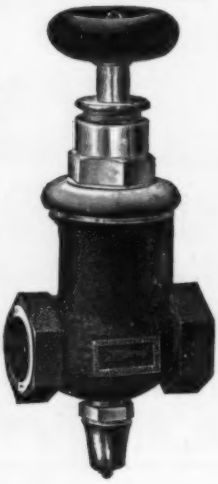


The Curtis Steam Pressure Regulator

Is a steam saving appliance which has been before the public 12 years, the constantly increasing sales of which are due only to its merits.

IT IS THE STANDARD.

Its use means a saving in operating expenses. This means increased earnings.

Manufactured by the

D'ESTE & SEELEY CO.,

29 to 33 Haverhill St., Boston, Mass.

NEW YORK: 109 Liberty St. CHICAGO: 218 Lake St.

of fire losses in the Lowell factories was so long maintained on their own mutual system of underwriting before they joined the larger combination. It is still in use. I may cite the Lawrence Mfg. Co., where the system had been established for many years.

"The force in the yard of the Lawrence Mfg. Co. consists of twenty-seven men, thirteen of whom are on duty at a time.

"The twenty-seventh man is the foreman of the watch. These men all sleep in the yard. Thirteen go on duty at noon, and during the afternoon they are handling goods, and doing any other work that they may be called upon to do. At six o'clock they begin their watching tours and follow them up until midnight, when they are relieved by the other thirteen, who perform watching service until the gates are open in the morning, when they perform yard duties, such as handling goods and the like, in a similar manner to the other gang which did that work in the afternoon. As a matter of course, these watchmen, as well as the similar forces in other mill yards in Lowell, are thoroughly trained and drilled in the use of the fire apparatus.

"It will be manifest to every intelligent mill manager that such a system, giving variation to the work, must of necessity be more effective than the employment of watch nen in that service only, watching all night and sleeping all day."

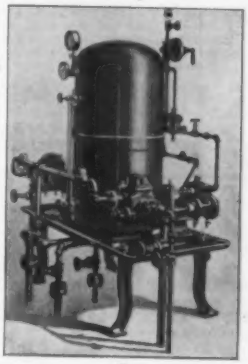
Graphite for Cycle Chains.

No material has so strong an affinity for iron and steel as pure soft flake graphite, and for bicycle chains and sprockets there is nothing equal to it. The Dixon Crucible Co., Jersey City, N. J., selects its choicest material from unlimited stocks, and, after analyzing all other cycle chain lubricants in the market that it could find, does not hesitate to say that Dixon's No. 691 cycle chain graphite is absolutely without an equal for preventing rust and wear of chain, and for insuring ease and comfort in riding. TOM W. WINDER, the man who rode 21,000 miles around the borders of the United States, was offered all sorts of chain lubricants, and Dixon's was found superior to anything offered. He says: "It saved me much hard work, as its application never failed to cause an easy running chain." No. 691 is the improved shape, and fits the tool bag easily. If your dealer does not keep it, send 10 cents for a sample, and you will never regret it. Dealers will receive a sample free of charge by sending their business card.

Fuel Oil Furnaces.

Improved **DUPLEX SYSTEM**

for SINGEING FURNACES.



Also for Annealing, Forging, Enameling Welding, Melting, Brazing, Drop Forging etc., with

FUEL OIL.

Furnaces Designed and Built for Every Purpose.

W. S. ROCKWELL & CO.,

Constructing Engineers,

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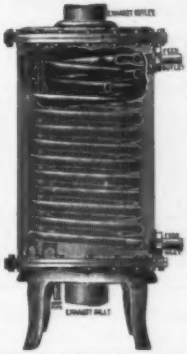
The American Feed Water Heater



The result of over 10 years experience in the manufacture of various styles of heaters. We use only best seamless

COPPER TUBING

The construction is such that there are

No Joints

inside of the shells consequently there are

No Leaks.

Send for Catalog.

THE WHITLOCK COIL PIPE CO.

Manufacturers

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JARVIS ENGINEERING CO, Agents for New England.

Hahn's Latest Improved **Watchman's Time Detector.**

This clock is adapted to six or twelve stations and the keys are all different. A liberal allowance made for old detectors. For circulars, prices and further information address,

NANZ & CO.,

111 Chambers Street,

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TO AVOID LOSS

NEVER SEND MONEY
IN LETTERS, BY MAIL.

ALWAYS

GET AN AMERICAN EXPRESS MONEY ORDER.

RATES LOWER AND SYSTEM SAFER THAN ANY OTHER METHOD.

DO NOT **CARRY MONEY WHEN TRAVELING.**

IT IS ENTIRELY UNNECESSARY IF YOU TAKE

THE TRAVELERS CHEQUES

OF THE AMERICAN EXPRESS COMPANY.

Cork Covering.

In a previous number I saw some remarks regarding driving belts. My experience of forty years is that all belts should be run as slack as possible and do the work required of them. After using all kinds of belting, and trying all the methods known, I at last tried the Lindsey cork pulley covering. I can run my belts for years, the ones that are endless, without one cent of cost for repairs, and my belts transmit all the power required. No heating of journals, no belt oils used but twice a year, then put on back side of belt, oil well; use crude castor oil. You can make a six-inch belt over the cork covering do the work of a 12-inch over iron or a wood pulley, with the same tension. Anyone troubled with a slipping belt can find all the relief he desires in cork pulley covering. FROM AN OLD MILLWRIGHT.

—Hill's Diamond A Cutch is recognized in the trade as a thoroughly first class article, which can be depended upon. Through long years of honorable dealing, the firm of Edward Hills's Son & Co. and their predecessors have established an enviable reputation for all their products. Besides cutch, they are also dealers in caustic potash, calcined carbonate of potash, and all the chemicals used in textile establishments. They are sole agents in the United States for the United Alkali Co.'s brands of caustic soda.

Reading Wood Pulley Works Active.

The Reading Wood Pulley Works, Reading, Pa., are working on a large export order for pulleys for John Holroyd & Co., who are their agents in Birmingham, Eng. This is the third large consignment of pulleys to Birmingham, the largest manufacturing district in the world, and its acceptance bespeaks volumes for the merits of the Reading pulley. The company have also just made a shipment to Moscow, Russia. They are making a specialty of large pulleys for ply-wheels and driving pulleys, and are at present engaged on a 14 foot pulley for the Reading Paper Mill Co., to transmit 200 horse power. They have orders in hand for 2 large pulleys for C. W. Hendels' hat works, Reading, Pa., 8 feet by 22 inches, and 3 large pulleys for Atlantic City. The company contemplate extensive enlargements.

—The Shove Mills, Fall River, have just had erected a quantity of electric stop motion drawing, supplied by the American Machine Co., Pawtucket, R. I.

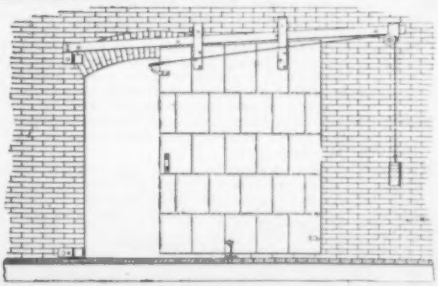
—The Fitchburg Duck Mills, Fitchburg, Mass., have just placed an order with the Pettee Machine Works, Newton Upper Falls, Mass., for their latest improved drawing frames.

Endorsed by Board of Fire Underwriters.
SUPERIOR TO
COTTON WASTE.
Safe, Durable and Cheaper.
RAW SILK MACHINERY WIPERS.
AMERICAN SILK MFG. CO.,
311 Walnut St., Philadelphia, Pa.
Agents Wanted. Beware of loose woven imitations.

Metalined or Oilless Bearings
For Loose Pulleys and other bearings. Perfectly clean. No cutting or danger of fire from overheating. Send for Loose Pulley circular No. 5.
North American Metaline Co.
62 W. Av. cor. 3d St., Long Island City, N. Y.

SMEALLIE BROS.

BOILER FEED and TANK PUMPS
In four sizes for Hot or Cold Water.
No. 2 Single, 130 gals. per Hour.
No. 3 Single, 420 gals. per Hour.
No. 3 Double, 840 gals. per Hour.
No. 4 Double, 1680 gals. per Hour.
Strongest and Cheapest Pump in the Market.
Write for Circular and Prices.
24 Livingston St., Amsterdam, N. Y.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Fire Proof Door
— AND —
Fixtures.
ESTIMATES FURNISHED.
VICTOR M'F'G CO. (Fire Fighters) Newburyport, Mass.

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ELEVATORS
THE GRAVES
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Improved Steam, Electric and Hand Power
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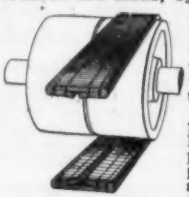
ELEVATORS, Hoists, Waiters for any place, capacity or weight, Electric, Steam, Hydraulic or Manual Motors, Shafting, Pumps, Boilers, Pipe, Hose, Drug and Paint Mills, Presses, Gearing, Mining and Coining Machinery, Street and Road Making and Sweeping Machinery.
GEO. C. HOWARD, 1783 Barker St., Phila., Pa.

Headquarters FOR ELECTRIC & PORTABLE Watchman's Clocks
Lowest Prices. Latest Improvements, Patents 1886-1893. Send for Circular.
E. O. HAUSBURG, 41 Maiden Lane, New York.
Price, Complete $10.00
THE "ALERT."

A. WATSON,
PATENT EXTERNAL Band Clamp Couplings.
No bolts to get out of order. Best coupling for keeping a shaft which has been worn out with other couplings. I will guarantee to put my couplings on the shaft and to do the work or no pay. The couplings can be put on by any millhand in a few minutes when the key is set ready to receive the coupling.
A. WATSON, Machinist and Engineer, 2136-8 Dickerson Street, Philadelphia.

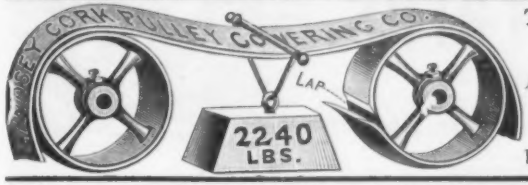
Perfection Belts,
Self Adjustable, Turned Over Edges.
Patented Dec. 27th, 1892.
English Patent applied for on an improvement.
For Conical Pulleys; Shifting and Quarter Turn Belts, NOW MADE OF
RAWHIDE.
Strong, Durable and Light Weight.

THIS is the most perfect belt made for driving Conical Pulleys. When an ordinary belt is placed on a pair of Conical Pulleys, it comes in contact with them at one edge, instead of across the entire face of the belt, owing to the fact, that the face of the belt is perpendicular to the plane in which the belt travels, while the surfaces of the pulleys are oblique to said plane. This produces an uneven tension on the belt, and renders it difficult to make it work properly. This defect is remedied by this improved belt. Its working face, is divided into parallel sections, and when placed over a pair of Conical Pulleys and tension is brought upon it, the sections hug the pulleys closely, for its whole width, the backing yielding sufficiently to allow this effect. The result is that the belt works with less wear, and transmits more power than a belt made in the ordinary way.

For rapid running SHIFTING BELTS, and for QUARTER TURNS they have no equal. Being made of one piece of leather in width, and TURNED OVER at the EDGES CANNOT POSSIBLY OPEN at the SIDES, by coming in contact with the shifter. Having a loose joint in the centre, prevents opening, and the plys separating, when used as a Quarter Turn Belt.

These belts are made from the best Rawhide Butts, prepared by a patented process. No lime or acids are used in the manufacture of the leather, from which these belts are made. The fibre of the leather is retained in its natural condition, making a leather soft, strong and pliable, from 30 to 50 per cent. stronger than any tanned leather. For Strength, Driving Power, and Durability these belts have no equal. They are much lighter in weight, will do more and better work, and will transmit more power, as they adhere much better to the pulleys on account of their soft and pliable surface, giving from 10 to 20 per cent. greater driving power.
Can furnish to order any width desired. Made endless if required. Every belt warrented perfectly satisfactory if properly used. Write for Price List, Samples and Discounts.
ADDRESS:
H. L. WEAVER, - Sole Agent.
(Manager Chicago Rawhide Mfg. Co.)
191-193 High St., Boston, Mass., U.S.A.

THE RHOADS BELT PRESERVERS

For Leather and Cotton Belts
PRESERVATIVE
ADHESIVE
J. E. RHOADS & SONS,
237 Market Street,
Phila., Pa.
Factory, Wilmington, Del.



The only reliable covering on earth.
Agents Wanted.
553 GRAND STREET,
Brooklyn, N.Y., U.S.A.

Machine Wipers.

The American Silk Mfg. Co., Philadelphia, will send on application, a neat little folder on the merits of their raw silk machinery wipers. It contains some valuable pointers on that useful article for mills, and gives testimonials from authentic concerns. The silk machine wipers of the American Silk Co. have found their way into many of the leading mills and electrical plants, and wherever a satisfactory test has been given them, have, we are informed, been generally adopted. They are washable and non combustible.

"It Glitters."

James Barker, of Philadelphia, whose original bulletin on doffer rubbers and combs, will be found in our April, 1896 (directory) issue, presides over a busy mill and produces a class of textile machinery which has become standard with the trade of all sections. Barker's two or three doffer rubbers and combs have been well termed a "glittering success" as their use always increases production and maintains the quality. Mills making yarn on the woolen principle should know the value of this machinery which is illustrated on page 178 of the April issue.

—The Cocheco Mfg. Co., of Dover, N. H., have recently been reported as about to build a new mill to be known as No. 5. Our representative was informed by agent Charles H. Fish that they did not intend to build this year. The Cocheco Mills are running at full time.

On the Southern question Mr. Fish feels, as many other manufacturers do, that at the present time mills well established in the South, with modern machinery, have a decided advantage over New England mills on certain grades of goods, and he does not think that the margin of difference will continue so great in future, on account of the many levelling conditions, principally those of increase in cost of labor, and the probability of legislative restrictions.

—The "Universal" paper parallel tubes that are being sent out to warp mills by Arthur L. Jacobs & Co., Boston, Mass., for balling warps on, in place of heavy wood rolls, are giving entire satisfaction to the users. Tubes, 4½" dia., and 18", 36" and 40" long, effecting a considerable saving, not only in first cost, but in freight.

—Biebrich patent black continues to increase in favor with the trade at large. Kalle & Co, New York, are sending out some handsome samples of yarn and cloth showing the fine effect of the Biebrich black.

THE DANFORTH BELTING CO.,
Manufacturers of
BELTING,
Aprons for Worsted Machinery, Roller Covers and Lace Leather.
221 Chestnut St., Philadelphia, Pa.

JOS. C. PAULUS & CO.,
Highest Grade Oak Tanned
BELTING
Philadelphia, Pa.

ALBERT RUSSELL
ENGRAVER
ON WOOD
38 PEARL ST.
BOSTON, MASS.

THE WEEKLY EDITION OF
SHELDON'S SPECIAL REPORTS
is the most Authentic Record of the important business changes constantly transpiring. Manufacturers should take it and use its columns for their announcements of new goods etc. Terms $2 per annum.
J. D. SHELDON & CO., Publishers, 54 Franklin Street, New York.

ALEXANDER BROS.
BEST OAK BELTING.
PHILADELPHIA.

Capital, $1,200,000.

100,000 SPINDLES.
Weekly Product 120,000 lbs.
14's to 160's.

HIGH GRADE

Cotton Yarns,

SPECIALLY ADAPTED FOR

Silk, Plush, Upholstery & Hosiery

MANUFACTURERS.

American Peelers. Sea Island. Egyptian Cottons.

Superior Qualities Combed and Carded—Furnished in singles, 2, 3, 4 and 6-ply chain warps, skeins, beams, spools, tubes, cones and Lisle Thread yarns.

Cops for Weaving and Twisting. Cops for Hosiery.

GLOBE YARN MILLS,

Fall River, Mass.

ARNOLD B. SANFORD, - - Treasurer.

Arnold B. Sanford, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

YARN DEPARTMENT.

The Eastern Yarn Market.

Cotton Yarn. Knitters have contracts placed for all their requirements at present and are anxious that the jobbers shall take goods already ordered. All are delaying shipments as much as possible. The finer goods at the low prices are replacing much of the cheap ribbed underwear. Colored yarns are going slowly and prices are being maintained from the fact that few if any orders are being entered. Combed Egyptian yarns are fairly well sold and contracts are being freely placed. The fine underwear is having the largest demand and we believe it is the best conditioned branch of the knit goods industry. Prices on carded yarns are not firm. On combed Egyptian and Allen seed prices are well maintained and concessions are not made.

Woolen Yarn. Spinners are getting some orders from the cloaking trade and also from knitters, though prices are very close and all are working cautiously. The mills running are making both ends meet, but the profit will not materialize until a later season. One manufacturer told the writer that he was running full, but was making no money. He is after reputation. The cheap cheviot is going the best at present. Prices quoted are very low, and it is believed that later a fair business is to be expected.

Worsted Yarn. Spinners are very short of orders and are selling yarn at the buyers' prices. The weavers are without orders, especially on fine worsted coatings and on clays. The mills are looking forward to the light weight season and also expect to have a very late heavy weight season, because, from a very conservative estimate, it must be conceded that clothiers have not purchased half the usual amounts. All have held off waiting for lower prices, and will later be forced on the market. Very few of the weavers carry stocks, and with the great curtailment of weaving machinery, the final outcome is a curious problem. The jobbers, because of the high prices in Europe, have purchased very lightly. Bradford is at a standstill on the clay worsted business and cannot understand the situation. The Europeans are holding off the market and are trying for higher prices, on the theory that we are to have a new tariff and orders will surely be placed at higher prices, to get the goods in before the new law would become operative. Some of them do not realize that at least twelve months must pass before such a theory would have weight. Knitters are using a fair amount of worsted yarn for underwear, and some orders continue to be placed for lustre yarn, although the knitters are very cautious what they do. The dress goods firms are doing very well and have many orders booked. Prices are nominal. Spinners are allowing but few orders to pass them.

We quote:

DOUBLE ROVING WHITE COP YARN.

11s and 12s . . .	16 cts.
16s	17 cts.
20s	19 cts.

Jaeger and Camel's Hair.

10s to 12s	17 cts.

Cones 1 cent extra.

Other colors quoted on application.

Egyptian Combed.

1/10s to 12s . . .	27 cts.
1/20s	28 cts.
1/34s	32 cts.
1/40s	34 cts.
1/45s to 1/50s . . .	39 cts.

Cones extra price.

Combined Capital Stock, $2,250,000.00
WM. D. HOWLAND, TREAS.

Total Spindles, 170,000.
BYRON F. CARD, AGT.

NEW BEDFORD MFG. CO.,
HOWLAND MILLS CORP'N,
ROTCH SPINNING CORP'N.

Single or Twisted, Combed or Carded. Hosiery Yarns, Chain Warps, Skeins, Spools or Cops, also on Beams from Nos. 10's to 120's.

HIGH GRADE COTTON YARNS.

Byron F. Card, Selling Agent.
NEW BEDFORD. MASS.

Frank E. Patterson, Prest. Oscar W. Wood, Treas.

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

EGYPTIAN COTTON

HERMAN CAPELLE,
Rothschild Building, Cor. Leonard St & W. Broadway
NEW YORK.

H. BINDERNAGEL Alexandria, Egypt.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. E. J. CARRIGAN, Sec.
Established 1860.—Incorporated 1893.

THE S. BLAISDELL JR., CO.,

Egyptian COTTON Peruvian

American Long Staple a Specialty. and all American Southern points.

Shipments direct to mill form Egypt, Peru
CHICOPEE, MASS.

Established 1865.

H. M. WITTER & COMPANY,
Manufacturers of
COTTON WEBBING, TAPES AND BINDINGS,
Worcester, Mass.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

ALLEN SEED COMBED.

1/10s	24 cts.
1/40s	32 cts.
2/40s	37 cts.

WOOLEN YARN.

Will quote on inquiry, as there is too great diversity to give satisfactory quotation.

WORSTED YARN.

Fine Australian.

2/40s	75 cts.

Other numbers in proportion.

2/50s	83 cts.

Half-blood domestic.

2/40s	68-72 cts.

DOMESTIC.

1/4 Blood,	
2/28s, 24s, 18s .	53-59 cts.
2/32s	55 cts.
3/8 Blood,	
2/32s	60 cts.
2/28s, 24s	60 cts.
1/2 Blood,	
2/22s, 28s	62 cts.

Philadelphia Yarn Market.

Manufacturers report business in no better shape than a month ago. In many instances it is duller. The business on fancy plaids has been worked so long, that manufacturers are averse to making anything except on orders now. The linsey season is just commencing in a small way. Cottonades and cotton worsteds ought to be active soon, and manufacturers are putting out their lines, although this business has been overdone lately and prices are extremely low.

Orders on heavy weight underwear will have to come in soon or there will not be enough time to make the goods up this summer.

There should be an increased demand for yarn in a general way, on account of the extremely slow way business has been done the past few months, yet we must say, yarn is lower to-day than a month ago, in many instances, while cotton is higher. This makes it very hard on spinners and many are considering shutting down, or at least running short time. Nothing could prevent a very sharp advance in yarns, if busi-

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. WARPS

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
51 & 53 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

J. H. LANE & CO.,
Commission Merchants.
COTTON and JUTE YARNS
110 Worth St., NEW YORK.
24 Kingston St., BOSTON.
151-53 Fifth Ave., CHICAGO.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY
54 Leonard St., New York.

SAWYER, MANNING & CO.,
YARNS,
86 & 88 Franklin St., NEW YORK.

O. H. SAMPSON & CO,
YARNS,
BOSTON, 67 Chauncy St.
NEW YORK, 58 & 60 Worth St.
PHILA. 206 Chestnut St.

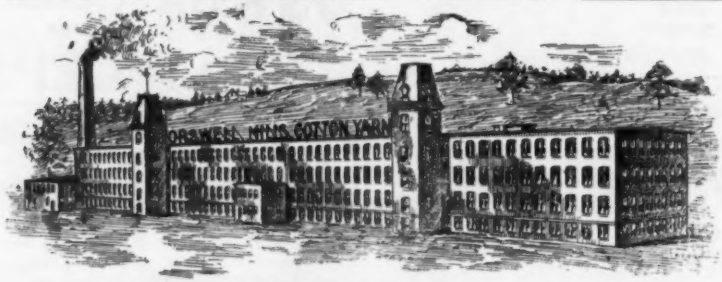
O. S. HAWES & BRO.,
WEAVING and HOSIERY YARNS,
All Plies and Numbers.
Imported Yarns a Specialty
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TRENTON WORSTED MILLS.
Trenton, N. J.
Manufacturers of
All Numbers of Worsted Yarns.
Knitting and Floss Yarns a Specialty.
A. FOSTER, Superintendent.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.



COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. PAWTUCKET, R.I.

Cotton Yarns AND WARPS Of Every Description.

James F. White & Co.

COMMISSION MERCHANTS,

54 an 56 Worth St., NEW YORK.
228 Chestnut St., PHILADELPHIA.

BURLAPS all WIDTHS and WEIGHTS.

Cotton Warps.

WHITTIER COTTON MILL, LOWELL, MASS.

W. WARREN THREAD WORKS,

Manufacturers and Importers of

Polished Threads and Cotton Yarns, WESTFIELD, MASS.

Colored Yarns and Threads on cones a specialty. We manufacture spool cotton, sewing thread, button-hole cord and seaming thread put up in any form to suit the trade. Sample sent upon application and correspondence solicited.

Our Bleaching and Dyeing facilities are Now and Unsurpassed.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double and Twist, COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

MALLISON ROPE WORKS, - ESTABLISHED 1827.

JOHN M. HODSON,

Single and Double Loop Bands for WORSTED and COTTON SPINNING.

ROPE, TWINES AND COTTON BANDINGS.

MANAYUNK, - PHILADELPHIA.

ness should brighten up a little, even though cotton should go down.

We quote:

WARPS.

20/1	12½ to 13 cts.
22/1	13 to 13½ cts.
26/1	14 to 14½ cts.
12/2	12½ cts.
14/2	12½ to 13 cts.
30/2 Southern	17½ cts.
30/1 Southern	16½ cts.
30/1 Eastern	17½ to 18 cts.
14/1	12 to 12½ cts.

SKEIN.

26s filling	14 cts.
20/1 soft	13½ to 14 cts.
19/1 soft	13½ to 14 cts.
4s to 10s soft	11½ to 12½ cts.
10s to 12s hard	10½ to 11½ cts.
12s soft	12 to 12½ cts.
20/2	14 to 14½ cts.
14s soft	12½ to 13 cts.

SOUTHERN CONES.

6s to 8s	12½ to 13 cts.
10s	13 cts.
12s	13½ cts.
14s	13½ to 14 cts.
16s	14 cts.
20s	16 to 16½ cts.
24s	17 to 17½ cts.
26s	17 to 17½ cts.

SOUTHERN COPS.

6s to 8s	12 to 12½ cts.
10s	12½ to 13 cts.
12s	12½ to 13 cts.
16s	13½ cts.
10s to 12s shuttle	12½ to 13 cts.

MIXED COLORED CONES.

6s to 8s	15 cts.
10s	15 to 15½ cts.
12s	15½ to 16 cts.
14s	16½ to 17 cts.

SKEIN.

8/3 carpet	11 cts.
8/3 slack	11½ cts.
9/4 slack	11½ cts.
10s double reeled	12 to 12½ cts.
16/3 slack	13 to 13½ cts.
16/4 medium	13 to 13½ cts.
2-1/2 to 4s soft	11½ to 12½ cts.
8s to 10s soft	12 cts.

EASTERN COPS.

26s shuttle	14 to 14½ cts.
40s	18½ to 20 cts.
12s	13½ cts.
10s hosiery	13½ cts.
12s "	13½ cts.
14s "	13½ to 14 cts.

KERR THREAD CO.
—SPINNERS OF—
Fine Combed Sea Island **COP SINGLES**
All Numbers, 30s to 150s.
Fall River, Mass.

BALE, STUART & CO.
Spun Silk, Cotton and Worsted **YARNS.**
31 George St., MANCHESTER, ENG.
495 Broome St., NEW YORK.

J. D. KENNEDY, Lessee
North Athens Cotton Mills,
Manufacturer of
COTTON WARPS AND YARNS
in numbers from 4s to 14s.
ATHENS, - - TENN.

ABEGG & RUSCH,
WORSTED YARNS
Dry Spun, Nos. 36s to 100s.
COTTON YARNS
Nos. 12s to 120s.
92 GRAND ST., NEW YORK.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

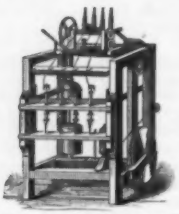
EICHMANN & STERNBERG
488-492 Broadway, c r. Broome St.,
NEW YORK.
Worsted Fancy Cotton **YARN**
HARNESS TWINES.
Spun Silks. Embroidery Silks.

Ramie Yarns.
Spun Silk, Tussah, Domestic and Imported Cotton Yarns.
HOSIERY YARNS A SPECIALTY.
HOLLAND & WEBB, 460 Broome St., N. Y.

HADLEY
SPOOL COTTON AND FINE YARNS
COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
95 Milk Street, BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.


Arkwright's Original Spinning Frame, invented 1768.

ESTABLISHED 1769.
SIR RICHARD ARKWRIGHT & CO., Ltd.
Manufacturers . . of . . COTTON YARN.
Single Yarns Carded and Combed. 2 ply CASSED YARNS, suitable for the silk, lace and suspender trade. Also WARPS from 60s to 200s.
Main Office for U.S.: 69 MERCER ST., near Broome St., NEW YORK.

The J. R. Montgomery Co.,
WINDSOR LOCKS, CONN.,
MANUFACTURE
LOOP OR BOUCLE YARNS, in Mohair and Worsteds.
COTTON SPIRAL OR LENO YARNS, to give leno effects with plain weave.
COTTON FLAKE OR KNOP YARNS for new effect in Cotton dress goods.
HIGH GRADE COTTON WARPS.
Also printers of Cotton, Wool or Silk Yarns.

MALCOLM MILLS CO.,
MANUFACTURERS OF
Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.
Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

YARNS
SOLIS - - BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

FINE WORSTED YARNS

OFFICE AND MILLS:
Broadway and Jefferson Ave.
CAMDEN, NEW JERSEY.

Hosiery AND Weaving Yarn

ALBERT IVINS CROLL,
BOSTON.

JAMES E. DALY,
SUCCESSOR TO
Johnson Extract Wool Co.
PATERSON, N. J.
P. O. BOX 250.
Fancy Colors in Wool Extracts a Specialty.

WOOLEN AND MERINO
YARNS. Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O

THE WILMINGTON MILLS MFG. CO.
MANUFACTURERS OF
JUTE GOODS,
CARPET FILLING AND RUG YARNS,
Wra ping, Baling, Tobacco, Hop and Wool Twines. Cords, Ropes, Packing and Specialties
WILMINGTON, DEL.

GERRISH WOOL & LEATHER CO.,
Manufactuers of
Calf, Sheep and and Lamb
ROLLER LEATHER,
Manchester, - New Hampshire.

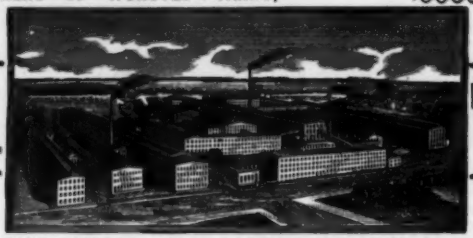
GEO. FELL & SON,
LEATHER MANUFACTURERS,
Bolton, England.
SPECIALTY:
ROLLER SKINS
PERSIAN, FOR EGYPTIAN AND SEA ISLAND COTTON YARNS AND FINE COUNTS
WELSH, FOR AMERICAN COTTON YARNS AND COARSE COUNTS.
Cable and Telegraphic Address,
"PELICAN BOLTON"
AI Code Used.

NATIONAL AND PROVIDENCE WORSTED MILLS.

CHAS. FLETCHER, President.

MANUFACTURERS OF WORSTED YARNS, SPUN ON THE

ENGLISH SYSTEM.



FRENCH SYSTEM.

Worsted Yarns in White, Mixed and Fancy Colors, on Bobbins, Dresser Spools and Skeins.

VALLEY STREET, PROVIDENCE, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co.,

MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

The Competition of Foreign Goods

On staple and plain fabrics under present tariff conditions makes it almost impossible to make any money, and the only hope of profit in making Dress Goods, Cloakings and Cassimeres seems to be in using

MOHAIR OR NOVELTY YARNS.

In the United States we are the only manufacturers from raw materials to finished product who make such yarns ONLY. Perhaps we can be of use to you.

CRANSTON WORSTED MILLS, Bristol, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

RIVER SPINNING COMPANY,

WOONSOCKET, R. I.

Belgian System WOOLEN and MERINO **Yarns.**

In any shade or quality suitable for making any class of Goods, domestic or foreign at prices to insure competition with imported goods of any description.

Selling Agents: JOHNSON & FARIE. Apply to Andrew Adie, 570 Bourse Building, Philadelphia.

16s " . . . 14 to 14½ cts.
20s " . . . 16 to 16½ cts.
24s " . . . 17 cts.

Skein, 1-2 c. above cops.

Cones, 1-2 c. to 1 1-2 c. above cops.

Egyptian (carded), 4 c. to 5 c. above white.

Egyptian (combed), 5 c. above carded.

Wool spun cotton yarn very dull:

20s cut black cops . 13 to 13½ cts.
12s . . . . 12½ cts.
15s . . . . 12½ cts.
Solid colors . . 15 to 15½ cts.

Woolen and merino yarns very dull at former quotations.

Worsted yarn very dull; demand extremely limited.

The Cotton Market.

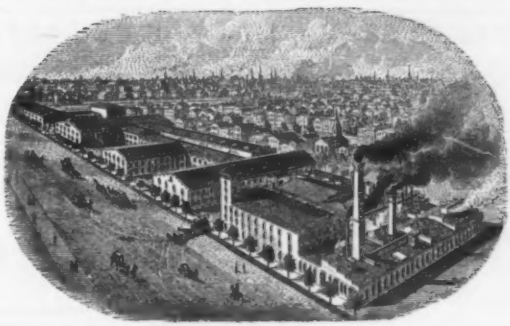
The first week in the month was marked by an active season of option trading, and prices were manipulated upward. A leading bull operator bought freely, forcing the short interest to cover, a fact which assisted in steadying the market. The upward movement was somewhat helped by certain wagers which had been offered, to the effect that the coming crop will not exceed nine million bales. Mills which have made contracts for goods, or else see lots which look cheap and suitable for their uses, are making purchases all the time. Besides this, there is very little which can be termed regular trading. The demand from foreign spinners keeps up fairly well.

For some time past, the attitude of the American spinner has been unmistakable. His purchases are made on the hand-to-mouth principle, simply enough to cover present necessities, or he is running his mill merely to use up stock already on hand. Inquiries are becoming more noticeable each succeeding week, so the brokers say, and this fact in itself is sufficient to permeate the market with a feeling of increased hopefulness.

The total visible supply for the last

LARGEST IN THE WORLD. ESTABLISHED IN 1870.

THE F. MUHLHAUSER CO.



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COLORED YARNS for HOSIERY

on Cones, a Specialty.

Correspondence Solicited.

EDWARD S. HYDE, 223 and 225 Chestnut Street, PHILADELPHIA PA.

week in April was 2,676,984 bales; for the same time last year it was 3,863,266 bales; for 1894 it was 3,225,140 bales, and for 1893 it was 3,199,507 bales. It will be noticed that the present supply is 750,000 bales below the average for the last three years, and this fact has much to do with the ease in which the market is manipulated. The deficiency at the present time must be in the neighborhood of a million bales. Much depends on the reports of the new crop. After the long period of dry weather, a wet May is by no means improbable, and should this be the case, a lively market would be the result, and speculation would be wonderfully stimulated.

The Wool Market.

The first of the present month marks the ending of another wool year, and there is more wool in stock on hand than ever before at the closing of the season. If not another pound was imported, there is nearly enough to supply the entire consumption for twelve months to come. Basing the estimate on figures officially reported by the Manufacturers' Association last year, the clip of 1896, was in the neighborhood of 275,000,000 pounds. Including wool waste, about 280,000,000 pounds were imported, bringing the total for the year up to approximately 555,000,000 pounds. Under consumption and large imports of foreign goods would indicate that the domestic production would not call for quite 300,000,000 pounds, and consequently there must be materially over 200,000,000 pounds of old wool yet remaining.

In the hope of attracting trade, wool dealers have generally submitted to the inevitable and quoted lower prices. The market is practically back to the lowest ebb of several years ago, but the low figure apparently has no effect on the trade at large. There is likely to be less speculation than during the

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THE ONLY
AUTOMATIC BANDING MACHINE
in the world for making loop bands.
Saving 50 per cent. in cost of making bands, besides giving a superior quality to those made on hand machines.
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Having doubled my former capacity, I am now prepared to scour the largest lots in the quickest possible time. Especial attention given to western shippers. All wools covered by insurance while in my possession. I deliver wool free of charge in Philadelphia. Immediate returns made on sample tests. All wools dried by cold air draft. Best of References. Correspondence Solicited.
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Custom Carbonizing and Garnetting a Specialty.

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FAST FANCY COLORS.

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Write for the Lowest Prices for
HIGH CLASS WORK.

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DYER of all kinds of **YARN** and **COTTON WARPS.**

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COTTON & COTTON YARNS, STOCKINET & JERSEY CLOTH.

OFFICE WITH **BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,**

E. G. BLODGETT, Prest. **PAWTUCKET, R. I.** E. W ORSWELL, Treas

past year, and the new clip will be more largely consigned than bought outright. No improvement is visible in the market for domestic wool, prices being nominal and very unsatisfactory.

During the past two weeks there have been more signs of returning confidence than at any time since the appearance of the new year. All the factors affecting the situation, however, are not imbued with a more hopeful feeling. It cannot be denied that there are causes for apprehension regarding a lower range of prices for materials in the near future; still those who are pursuing a conservative course, neither making extra efforts to sell, nor holding back for unattainable prices, contrive to find some business under present conditions. In spite of the fact that money is easier than it has been, neither manufacturers nor dealers appear to take much interest in the coming clip.

News from Washington is being closely watched by wool dealers, as political events have always made an impression on the market. An immediate advance in stocks was the result of the passage of the gold plank in the Massachusetts Republican platform. In case a pronounced sound money candidate, on an equally sound money platform, should be nominated at the St. Louis convention, financial confidence will be restored, and the timidity of the past year regarding purchases and investments is expected to disappear. Should Mr. McKinley, the idol of the wool growers, receive the nomination, a boom in the growing section may result; but unless the Major announces himself uncompromisingly in favor of sound money, such a boom is not likely to encourage either mill building or wool purchasing, except for immediate needs. It is stated by the friends of all the candidates now mentioned, that any Republican who may be elected will, as soon as possible, call a special session of Congress to remain in session till a tariff is passed, or defeated in the Senate like the Dingley bill.

—The B. F. Sturtevant Co., Boston, always contrive to send out fine specimens of the printer's art, but the little volume entitled "Ventilation and Heating," is decidedly above the average. It is considerably more than an advertisement of their blower system, and contains a large amount of useful tables and valuable information. Previous editions of the work have been entirely revised and greatly enlarged. In clear concise language the points to be considered and the steps to be taken in deciding upon a system of heating and ventilating are stated. Very modestly they point to the merits of their own work, and suggest that the successful operation of the Sturtevant system in thousands of buildings in this country and in Europe is the best evidence they can offer as to its efficiency.

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BLEACHERS, DYERS AND FINISHERS

Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Goods. Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flanneletts, and all descriptions of Dyed Goods.

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Being equipped with the French and other Foreign and Domestic Napping Machines, we are prepared to give any kind of Nap required, including the French Flannel Finish

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CLEANS WOOL, FLOORS, ANYTHING.
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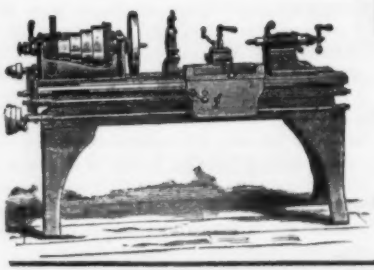

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Blaisdell's Patent Upright Drills
with Quick Return Motion.

ENGINE LATHES, PLANERS,
Boring Mills, Gear Cutters, and Hand Lathes

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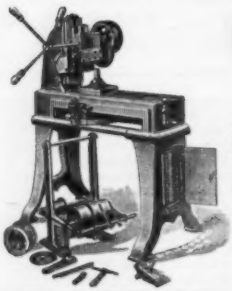

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Especially adapted for use in Repair Shops. Now in use in nearly **ONE HUNDRED** representative mills, including **Twelve** in Fall River, Mass. On application, we shall be glad to submit full particulars, prices, and photographs of latest improvements. Send for our Sheet of References.

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MANUFACTURER OF **MACHINE WOOL COMBS,**

Hackles, Gills, Fallers and Porcupines. Tentering Pin Plates. Also Cotton Combs neatly re-needled. Dealer in the Best English and American Cast Steel Pins and Comber Needles.

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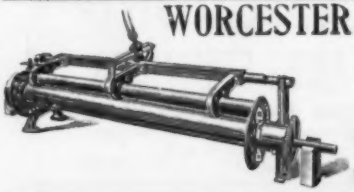

FOR COMPRESSING WARPS ON BEAMS.

30 to 50 per cent. more yarn on a beam. 30 to 50 per cent. saving in drawing in, and in thrums, headings, etc.

No broken ends. No section Streaks.
No run arounds. No over-strained yarn.

Better Cloth and Larger Production.

Machines set up on approval.

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BUILDERS OF

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WATER WHEEL GOVERNORS, SHELL ROLLS.

General Foundry and Machine Work, Repairing

COHOES, NEW YORK.

MILL NEWS.

Cotton.

New Mills.

—ALABAMA, Birmingham. B. H. Finney, of Atlanta, Ga., is in the city, and it is reported he is endeavoring to interest the citizens in the organization of a $200,000 cotton mill company, and that he proposes to organize on the co operative plan.

—ALABAMA, Opelika. A proposition has been made for the erection of a cotton mill of 30,000 spindles and 1000 looms at this place. Hon. R. B. Barnes is interested in the matter, and will use every endeavor to have the terms of the proposition met.

—*ALABAMA, Oxford. Grading has been commenced on the site of the cotton mill which will be erected just south of this place by the Blue Springs Mill Co. The buildings will be erected as soon as possible.

—*ALABAMA, Phenix City. Concerning the new cotton mill which we reported was going to be built here, we are now informed that Mr. John Hill and G. B. Jordan, of Columbus, Ga., are the gentlemen who are at the head of this movement.

—*ALABAMA, Selma. Work is progressing rapidly on the site of the new Selma cotton mill. The artesian well has been completed, the excavations for the foundations are almost finished, and the brick masons will start to work in a few days. A committee consisting of Messrs. Ernest Lamar, F. M. Stilwell, and S. B. Holt, will leave here in a few days for the East, to place orders for machinery.

—*FLORIDA, Ocala. President F. A. Teague, of the Ocala Board of Trade, in conjunction with other members, propose to hold a meeting shortly to agitate the subject of getting up a company to secure capital to join the New England party who is willing to advance the machinery if the people here will contribute $15,000 towards starting a cotton mill It is their intention to form a company on the co-operative plan.

—GEORGIA, Austell. C. J. Shelonton is interested in the establishment of a cotton mill and a knitting mill.

—GEORGIA, Cedartown. The machinery for the Cedartown Cotton Mfg. Co. is en route, and will be placed immediately upon arrival, so that operations may commence in the near future.

—*GEORGIA, Rome. The Massachusetts Cotton Mills have shipped their first cut of cloth woven to Lowell, Massachusetts. The 1000 looms which this new mill contains will soon be in operation.

—GEORGIA, Union Point. The citizens of this place are endeavoring to form a company for the purpose of erecting a cotton mill.

—*LOUISIANA, Monroe. Concerning the movement here for the establishment of a cotton mill we learn that J. F. Hordebecker, of Kankakee, Ill., and J. H. Johnston of Palestine, Texas, are now here aiding the citizens to accomplish their object.

—MASSACHUSETTS, Fall River. It is reported that Joseph McCreery, formerly of the Shove Mills, has secured an option on a large tract of land in this city, near the state line, and it is believed that he is acting for a syndicate of capitalists, with a view of erecting a cotton factory for the manufacture of a fine grade of goods.

—MISSISSIPPI, Canton. The business men in this place are now contemplating the erection of a cotton factory, and as soon as the Canton Water Works plant is completed, it is said that the cotton mill will be pushed.

—*NORTH CAROLINA, Elizabeth City. The buildings of the Elizabeth City Cotton Mills are rapidly being pushed forward. The brick work is almost complete and the boiler and engine houses are finished and have their respective roofs all on. The carpenters are now busy at work on the card room floor, etc. The machinery for this mill is being supplied by the American Machine Co., Pawtucket, R. I. They received the order for the pickers, cards, drawing, slubbing, intermediate and roving frames. The drawing frames will have the electric stop motion. The spinning machinery will be built by the Fall River Machine Co.

—*NORTH CAROLINA, Fayetteville. The Holt Cotton Factory is almost completed, and will be ready to receive the machinery the latter part of this month.

—*NORTH CAROLINA, Mount Pleasant. The new mills which we reported W. R. Kindly contemplated erecting, we are now informed will be commenced about June 1st. The mills will be known as the W. R. Kindly Cotton Mills. Capital $30,000.

—*NORTH CAROLINA, Reidsville. According to information now at hand, the Edna Cotton Mill will, when completed, contain 15,000 spindles and 300 looms.

—NORTH CAROLINA, Salisbury. Messrs. F. J. Murdoch, E. T. Garsted, W. S. Blackmer and N. D. McCanless, together with other parties interested in cotton manufacturing, have formed a company to be known as the Spencer Manufacturing Co., to erect a mill for utilizing the waste of cotton mills.

—*NORTH CAROLINA, Spray. Concerning the cotton mill that we reported a Greensboro party intended to erect at Leakesville, the party now informs us that it has been decided to build the mill in this place, a 10,000 spindle mill is contemplated with a capital of $120,000. The name of the mill will be the Spray Cotton Mills. They will manufacture cotton yarns. Water will be the motive power. The officers are: George A. Melbone, president, F. J. Murdock, treasurer. They are now in the market for the following: Automatic sprinklers, electric lighting apparatus, elevators, fire hose, iron smoke stacks, penstocks, pulleys, shafting, hangers, and a general line of mill supplies.

—RHODE ISLAND, Cranston. There is a project on foot in this place for the forming of a corporation to build a cotton mill between Cranston Print Works and Olneyville. The site upon which the prospective mill is to be erected is on the bank of the Pocasset River, and borders on Dyer Ave. The stock books are now open, and so far it is said more than half of it has been sold.

ANYTHING

Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.
PROVIDENCE, R. I.

in Mill Supplies.

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General Mill Furnishers, AND DEALERS IN Machinery, Machinists' Tools, Etc.

Special attention paid to Equipment of New Mills.

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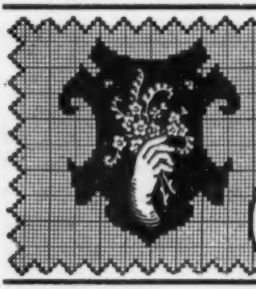

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FREDERIC HAND & CO.,

157 & 159 Van Houten St., - PATERSON, N. J

GOLD MEDAL

Reeds and Harness,

Manufactured by

J. A. GOWDEY & SON,

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Send for Price List before purchasing elsewhere.

STEEL AND BRASS

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REEDS, HARNESSES, LINGOES, SHUTTLES AND QUILLS.

ELLIOT CLOTH FOLDER AND MEASURER

For Cotton and Gingham Mills, Bleacheries, Print Works, Etc.

MANUFACTURED BY

ELLIOT & HALL,

54 1-2 Harmon St., Worcester, Mass. Send for Circular

—SOUTH CAROLINA, Aiken Junction. A report is being circulated here that Charles W. Davis, of Graniteville, will erect a 20,000 spindle cotton mill at this place. It is said that the mill will cost $300,000, and that standard print cloths will be manufactured.

—SOUTH CAROLINA, Columbia. Subscription books for stock of the Broad River Mills Co., we are informed, are now open. It is the wish of the projectors to have a 20,000 spindle mill, capitalized at $250,000, the mill to be built this summer.

—*SOUTH CAROLINA, Edgefield. The Edgefield Cotton Mfg. Co., whose progress we have repor ed from time to time, has now placed a contract for their new mill, which will be erected at this place. According to the contract, the building will be completed by September. The mill will start up with 5000 spindles and 180 looms. It will be lighted by electricity.

—*SOUTH CAROLINA, Johnston. Books are now open at the Johnston Bank for subscriptions to the stock for the new cotton mill.

—*SOUTH CAROLINA, Landrum. It is reported that enough stock has been subscribed to insure the success of the new cotton mill that we previously reported would be built here. It is understood that S. B. Ezzell of Spartanburg, will be the president and general manager. It is thought that the company will be fully organized during the present month.

—SOUTH CAROLINA, Perry. P. P. Toale contemplates erecting a mill for spinning cotton and knitting cotton hosiery and underwear.

—SOUTH CAROLINA, Rock Hill. Work on the new Manchester Cotton Mill will probably begin this month. The brick is now being made.

—*SOUTH CAROLINA, Spartanburg. R. Zim Case, John B. Cleveland, Joseph Walker, J. B. Reed, S. J. Simpson and W. F. Smith have made application for the incorporation of the Arkwright Mills. Capital stock $200,000. It is their intention to start work as soon as possible.

—*TENNESSEE, Cartersville. We understand that W. S. Witham, president of the Georgia Bank, also the Bank of Cartersville, is now heading the movement for the erection of a new cotton mill in this place.

—TENNESSEE, Chattanooga. E. G. Richmond and W. D. Roberts are talking of building a cotton mill to cost $100,000.

—TENNESSEE, Lenoir City. A company is being organized here for the purpose of establishing a mill for the manufacture of cotton yarn. J. W. Grizzell is to be secretary of the company.

—*TEXAS, Austin. Concerning the progress of the movement for a new cotton mill, we are informed that the subscriptions to the stock now amounts to $93,000. The total amount will be $100,000.

—TEXAS, Hearne. The Commercial Club, recently organized with Mr. James L. Haslett as president and Mr. Thomas Reinhart as secretary, has started a movement to organize a company for the purpose of erecting a cotton mill.

—*VIRGINIA, Danville. The Riverside Cotton Mills Co. has purchased the improvement and right for the Dan River Power Co., located near this city. The latter company has been arranging for the erection of a 40,000 spindle cotton mill on a water power, and this purchase will carry out their plans to completion. The erection of the building will be commenced in the near future. The Riverside Co. already operate 65,000 spindles.

GEORGE L. SCHOFIELD,
DEALER IN NEW AND SECOND-HAND
MACHINERY,
123 N. Front Street, Philadelphia.
Agent for Weston Hydro-Extractor in Pennsylvania.

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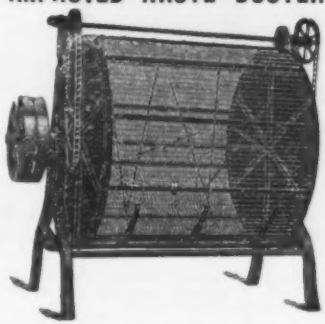
FINISHING MACHINERY for Brushing, Calendering, Drying, Dyeing, Fulling, Lapping, Rolling, Folding, Measuring, Pressing, Steaming, Shearing, Singeing. Blades, Spirals, Brushes furnished or repaired: Wire Looms, Forming Press for Febrille Goods, Metals or Hats. Perforating, Plate Printing, Engraving Machines. Paper Mill, Box Printers and Binders Machines.
GEO. C. HOWARD, 1783 Barker St., Phila., Pa.

Established 1844.
BENJ. BUCKLEY'S SON,
(WM. J. BUCKLEY)
GUN MILL, PATTERSON, N. J.
Manufacturer of all kinds of
SPINDLES, FLYERS, RINGS, TUBES, CAPS, &C.
FOR
Cotton, Silk, Flax, Woolen and Worsted
MACHINERY.
Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

IMPROVED WASTE DUSTER



For Cleaning Wool Waste. Superior to any now in use. Manufactured by the Stillman-Rich Machine Co., Westerly, R. I. Send for circular.

Woolen Machinery For Sale.
One 36 inch Davis & Furber Picker, with Bramwell feeder, nearly new.
One 36 inch Sargent Burr Picker, with extra new cylinder.
One James Smith & Co. { 3 cylinder 60 in. wide, Garnett Machine.
One Butterworth Dryer, { capacity 66 yards, good condition.
Four Davis & Furber, Up and Down Gigs.
One Davis & Furber Double Acting Gig.
Two Davis & Furber Rotary Gigs.
Address A, TEXTILE WORLD.

—VIRGINIA, Portsmouth. The Portsmouth Cotton Mfg. Co., which it will be remembered was placed in the hands of a receiver soon after their mill was built, and before all the machinery had been placed, is now endeavoring to perfect plant to put the mill in operation in the near future. Estimates to equip and complete the plant are now being obtained.

Enlargements and Improvements.

—*ALABAMA, Birmingham. The Birmingham Cotton Mfg. Co., who commenced operations the first of the year, are now enlarging their plant.

—CONNECTICUT, Moosup. The Aldrich Manufacturing Co., it is reported, will build a large addition to the Union Mills this spring.

—GEORGIA, Atlanta. A report states that the Fulton Bag & Cotton Mills, through the president, Mr. Jacob Elsas, has just sold $300,000 worth of bonds to Atlanta parties. It is understood that the proceeds of the bond sale will be used in increasing the facilities of the mills, and that their capacity will be tripled.

—GEORGIA, Roswell. The Roswell Manufacturing Co. intend adding 1500 spindles to its plant.

—MASSACHUSETTS, Holyoke. The Holyoke Warp Co. are making additions which will double the capacity of their plant.

—MASSACHUSETTS, Milbury. The power plant of the Milbury Cotton Mills is to be increased by the addition of two large turbine water wheels. The plans are now drawn and the work will soon be under way. The contract for the work, we are informed, has not yet been awarded. It is said that these improvements are the forerunner of a large addition to the mill as soon as business improves. Should these plans be carried out, the capacity of the plant will be nearly doubled. They now run 11,800 spindles and 272 looms.

—NORTH CAROLINA, Monbo. The Monbo Manufacturing Co. will erect a new building in which to place additional machinery. The structure is to be of brick, 180 feet long and 80 feet wide.

—MICHIGAN, Minden City. Daniel Moore & Son are making improvements in their woolen mill, and a new boiler and engine room will be built and some looms added to their equipment.

—NEW YORK, New York Mills. Spinning machinery will be added to the plant of the New York mill.

—NORTH CAROLINA, Cedar Falls. The Cedar Falls Manufacturing Co. will replace their old spindles with new.

—SOUTH CAROLINA, Bamberg. The directors of the Bamberg Cotton Mills have decided to increase the capital stock of the company and double the capacity of the mill. It is said that the necessary additional stock has been sold, and that work on the new building, or addition, will be commenced at once.

—VIRGINIA, Richmond. The Marshall cotton mill will put in 60 new looms immediately and other new machinery.

Mills Starting Up.

—NEW JERSEY, Newark. The Clark Mile End Thread Co. which has been running short time for the past two years has started up on full time.

Mills Shutting Down.

—MASSACHUSETTS, Fall River. It is stated that the American Printing Co. will shut down the print works at once.

—MASSACHUSETTS, Fall River. About 400 sateen looms at the King Philip Mill have been stopped.

—MASSACHUSETTS, Lawrence. The Everett and Pemberton mills have reduced their running time to forty hours a week. The mills employ about 1250 and 850 hands respectively.

—PENNSYLVANIA, Springfield. The cotton mills of Albert Lewis have closed down. About 100 hands are thrown out of employment.

—RHODE ISLAND, Providence. The Allen Print Works have closed down.

Woolen.

New Mills.

—*MASSACHUSETTS, Lawrence. Langdon E. Locke, the Lawrence contractor, has been awarded the contract for building the new Arlington mill. The work will begin immediately.

—RHODE ISLAND, Pascoag. Foundations are being put in for a new worsted mill on the site of the old Silver Lake Mill which was destroyed by fire a few months ago. Mrs. Catherine Magner is building the new mill which will be 150 by 36 feet, 2 stories with an engine and boiler house, 56 by 36 feet, and a dye house 50 by 36 feet. This is about twice the size of the old plant and will cost $15,000.

—SOUTH DAKOTA, Pierree. The Pettingill Manufacturing Co. has been incorporated to conduct a woolen mill. Capital $250,000. The incorporators are A. J. Pettingill, A. J. Pettingill, Jr., and L. A. Perkins.

—TEXAS, Laredo. H. L. Brook, of Philadelphia, Pa., will endeavor to complete arrangement for the erection of a woolen mill in this place.

—*WEST VIRGINIA, Morgantown. The machinery in the old Riverside Woolen Mill, Terre Haute, Ind., is being torn down, preparatory to removal to this place, where it is to be re set and operated in the Monongahela Textile Co.'s new plant.

Enlargements and Improvements.

—ILLINOIS, Lacon. A report from here states that Juno Grieves' Sons, woolen manufacturers, have purchased the Lacon Woolen Manufacturing Co.'s plant, and that they will move the entire plant from its present location at the upper end of the town to the lower end, where their mill is located, and consolidate the two. The price paid is said to be about $8000, and is considered to be about 20 per cent of its actual worth.

—MAINE, Pittsfield. New cards will be placed in the Pioneer Mill.

—MASSACHUSETTS, Franklin. The Ray Woolen Co. will probably erect a new dye house some time during this month.

—*MASSACHUSETTS, Franklin. The change that the Franklin Cotton Mfg. Co. is about to make will necessitate the employment of 40 additional hands. They will manufacture men's medium wear. They will increase their number of looms by 20. They will also put in 4 new sets of cards. The name of the company will be changed from Franklin Cotton Manufacturing Co. to Franklin Cloth Manufacturing Co. They will dispose of their cotton machinery.

Mills Starting Up.

—INDIANA, Indianapolis. The Geissendorf Woolen Mills, which are now shut down, will resume operations at once.

—MASSACHUSETTS, Webster. The Slater Woolen Mill employing about 800 hands has started up on full time.

—OHIO, Edgerton. The woolen mill recently purchased by M. Kelley has been repaired to the extent of some $600. New machinery has been put in and the mills have been started up on full time with a full force of help.

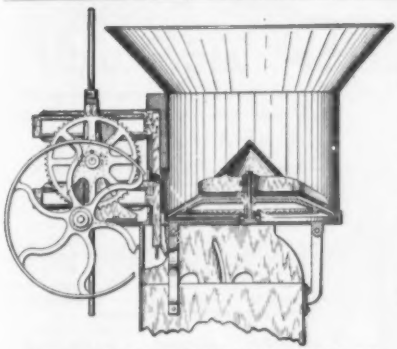
—PENNSYLVANIA, Lewistown. Webb & Son have started the machinery in their woolen factory, and will run the mill full time with a full force. The mill was shut down last fall.

—PENNSYLVANIA, Parkersburg. E. A. Pond and Daniel Pettigrew, of Oldtown, Me., have recently purchased a woolen mill in this place. They will soon move here, as they will run the plant themselves.

Mills Shutting Down.

—NEW YORK, Amsterdam. Louis E. Harrower has closed his knitting mill.

—NEW HAMPSHIRE, Wilton. The Wilton Woolen Co. has shut down. They employed 300 persons.



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We Claim:

THAT, these machines will pay for themselves within six months.

THAT, as the machine requires only occasional filling, the services of one man two hours per day is sufficient for the working of two machines.

THAT, as the machine is constructed entirely of metal, without aprons, it is practically indestructible by fire.

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A labor-saving device for reducing to a minimum the cost of feeding thread extractors, etc.

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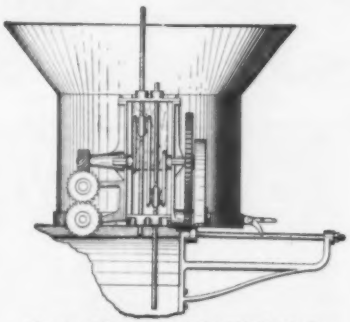

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NEW YORK.

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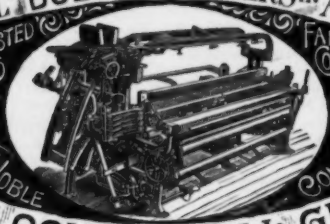
ORIGINAL FANCY LOOM DOBBY BUILDERS IN AMERICA

FANCY WOOLEN & WORSTED CLOSE-SHED LOOMS.



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POWER LOOMS OF ALL GRADES.

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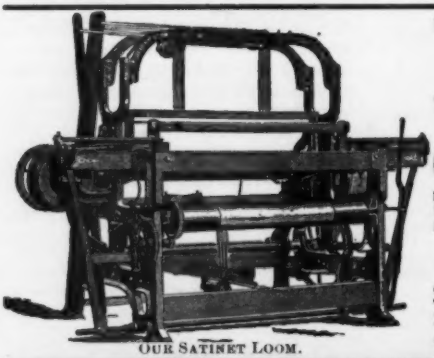

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Open Shed Full Fancy Looms

for weaving Worsteds, Woolens and Dress goods. Positive Open Shed Dobby for light or heavy weaving.

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OUR PATENTED SPECIALTIES.

DOUBLE RIBBED RINGS U.S. STANDARD. TRAVELER CLEARERS. METALIC BURNISH LIKE THAT PRODUCED BY THE TRAVELER.

GEO. GERRY & SON,

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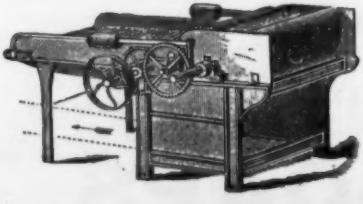
Manufacturers of



LUMPERS

WOOL and WASTE DUSTERS,

RAG DUSTERS, NAPPERS,

Improved

CLOTH MEASURING MACHINES.

Lumper and Duster Cylinders Refilled and Repaired.

Miscellaneous.

New Mills.

—MASSACHUSETTS, Glendale. It is reported that arrangements are about completed between Morris S Hermen, of New York, the owner of the Adams Mill property and water privilege in this place, and Benjamin Hay, of Cleveland, Ohio, whereby the latter will obtain possession of the Adams property and start a shoddy mill there, and that a new mill will be built on the site of the one destroyed by fire.

—MICHIGAN, Plymouth. George Beck & Co. of Detroit, will erect a flax mill at this place. A twine and rope mill is also contemplated.

—NEW JERSEY, Rockaway. A new company has been organized here to be known as the Llondale Bleach, Dye & Print Works. The capital is $250,000. They will erect a building 380 by 80, 2 stories. Lockwood, Green & Co., 131 Devonshire St., Boston, Mass., are the architects, and they will have the entire charge of this matter, and should be addressed concerning machinery, etc. The work will be pushed rapidly forward. Steam will be the motive power. This is a new plant and will require new machinery throughout.

—SOUTH CAROLINA, Cheraw. Concerning the plant for the manufacture of sash cord, lamp wicks, corset laces and shoe strings, which we reported E. A. Palmer, of Providence, would establish here, we have the following additional information: The company will be known as the South Carolina Braiding Works, and will be run by E. A. Palmer. Their principal specialty will be the manufacture of solid braided ropes. The machinery is now on the way here from Providence, R. I.

Fires.

—ALABAMA, Tuscaloosa. Fire in the mills of the Tuscaloosa Manufacturing Co. caused a loss of from $12,000 to $15,000 which was fully covered by insurance.

—GEORGIA, Douglasville. The Eden Park Factory, just completed, at a cost of $135,000, has been entirely destroyed by fire. The mill was insured for $75,000. It is probable that money will be raised to rebuild the mill immediately.

—KENTUCKY, Georgetown. April 10th. Fire in the warerooms of the Blue Grass Cordage Co. did several thousand dollars' damage. The mills have not been in operation for some time, and the fire, which was among the twine, is supposed to have originated from spontaneous combustion. There was no insurance on the stock.

—MASSACHUSETTS, Amesbury. April 23rd. Fire was discovered in the picker room of No. 2 mill of the Hamilton Woolen Co. this afternoon. The company's fire department succeeded in extinguishing the blaze. The loss is heavy, mostly on machinery and bales of cotton. Fire was caused from spontaneous combustion.

—MASSACHUSETTS, Brookfield. April 24th. The picker and stock houses of the Mann Brothers' cotton mill were entirely destroyed by fire last night.

—MASSACHUSETTS, Hyde Park. April 16th. P. H. Gray's shoddy manufactory, situated on Hyde Park Ave., was damaged by fire to the extent of about $5500. The loss is said to be fully covered by insurance.

—MASSACHUSETTS, Uxbridge. The 3-story satinet mill, in Happy Hollow, owned by D. M. Lee, has been entirely destroyed by fire. Loss $15,000. Partially insured. It is thought that the mill will be rebuilt.

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SELLING AGENTS
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Braiding Machines for all Purposes.
Machines for Covering Electric Wires and Cables, Packing Braiders, Gimp Machines, Spooling and Doubling Machines, Special Machinery.
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FOR CARDING ENGINES.
38 River St., Providence, R. I.
Advantages Gained by Using Above:
Cleaner stock, stronger yarn, more yarn, and less card waste.

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Top Roll Coverer.
HAND MADE COTS TO ORDER FOR SOUTHERN TRADE.
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Coal Tar Colors,
By George H. Hurst, F. C. S., member of the Society of Chemical Industry.
Corrected up to Date.
This book is an invaluable work of reference to the dyer and calico printer, and all who have to do with coal tar colors. It contains in alphabetical order an account of every coal tar color that is made, with a full description of its properties, particular attention being given to the methods of using it in dyeing, calico printing, etc. The book also contains some special articles on the methods of applying coal tar colors, and on tar products used in the color trade, such as aniline, napthol, napthalamine, phenol, etc.
The first edition, which is now out of date, owing to the number of colors since introduced, was completely exhausted within a few month after issue, and this second edition is made necessary by the large number of orders received, which it was impossible to fill; also by the constant advance made in this line of industry. The work has been most heartily commended by the textile and technical press.
Mr. Hurst's was the first dictionary of coal tar colors ever published in the English language, and still remains the most practical, from the dyer's point of view, giving him just the sort of information he specially requires about the dyeing of tar colors.
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Publications descriptive of the South will be mailed free. Address,

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—MASSACHUSETTS, Worcester. April 15th. A shoddy mill near Jefferson, owned by Hon. M. V. B. Jefferson, was burned this afternoon. Loss $3500.

—MISSOURI, Wellsville. April 17th the Wellsville Woolen Mills and machinery were entirely burned. The loss is said to be $12,000, and no insurance.

Failures and Suspensions.

—MAINE, Pittsfield. April 12. Dennison Walker, who has done business in this place for years, formerly a member of the firm of Robert Dobson & Co., but for a number of years proprietor of the Maple Grove Woolen Mill, which he built and has operated, has assigned to his brother, J. H. Walker, formerly cashier of the Pittsfield National Bank, but of late a book-keeper in Maple Grove Mill.

—MASSACHUSETTS, Methuen. We have a report that the Tremont Worsted Co., manufacturers, has made an assignment to H. Dow, of Lawrence.

—NEW YORK, Amsterdam. It is reported that the United Knitting Co. has made an application to the attorney general for leave to commence action of dissolution. The application is made on general grounds of insolvency. Their financial condition is said to be as follows: Liabilities, $125,000, assets, $75,000, mortgage on real property, $25,000. The officers are president Harvey L. Kennedy of New York, treasurer Francis A. Fales of Troy, secretary Andrew M. Church of Troy.

—NEW YORK, Baldwinsville. The rumored embarrassment of the knit goods firm of J. C. & J. C. Miller, at this place, is verified by the filing of the assignment in the Onondaga County Clerk's office, at Syracuse. T. H. Benton Crane, cashier of the First National Bank, of Amsterdam, and Willis Wendell, also of Amsterdam, are the assignees. As yet it is impossible to secure any figures as to the liabilities of the firm, but a conservative estimate places them at half a million dollars. The assets consist of the knitting plant, a ten-set mill, and an electric light plant located here, stock, accounts, etc. The mills are shut down.

—NEW YORK, New York. William McFarlane & Co., manufacturers of thrown silk at 81 Grand St., assigned to-day. It is said that they claim a capital of $100,000.

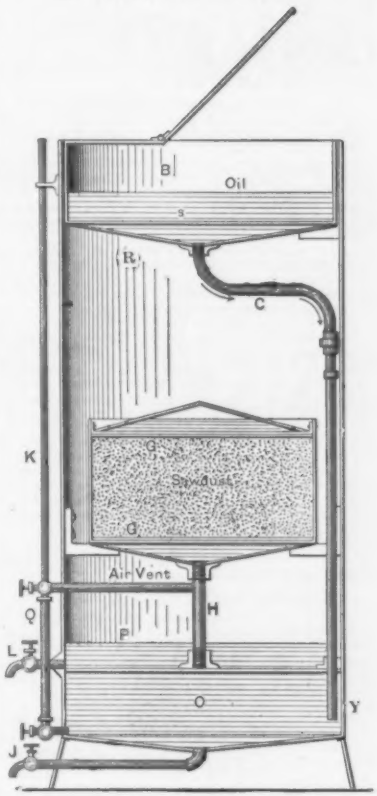
—NEW YORK, Watertord. Francis A. Fales of Troy, has made application for a receiver for the Hudson Valley Knitting Co. The liabilities of this company are said to be $90,000, assets $45,000, mortgage on real property $9000. The officers of this company are president, Edward W. Scott of New York, treasurer, Francis A. Fales, secretary, K. B. Dowsley of Troy.

—PENNSYLVANIA, Manayunk. The Canton Mills Co., against which executions for a large amount were recently issued, have made an assignment for the benefit of the creditors to George E. Hoffman. The deed is signed by John T. Holt, president, and Arthur K. Marsden, secretary, and conveys considerable real estate in Manayunk. Assignee Hoffman roughly estimates the liabilities of the concern at $150,000. He thinks the company may be able to settle with their creditors in full.

—PENNSYLVANIA, Philadelphia. Tobias H. Walters, manufacturer of hosiery, 117 N. 4th St., made an assignment last week to Alexander Nelson. The deed of assignment conveys the property on Thompson St., east of 24th St., and all the goods, stock and fixtures in the factory.

Do You Filter Oil?

IF NOT, YOU SHOULD.



PORTER'S OIL FILTER is the best made. We can prove it to any practical man who will give five minutes to the subject. Here are a few reasons:—

1st. Simplicity. Nothing to get out of order.

2nd, and great reason. The oil filters up instead of down, thus all the impure substances are left at the bottom of the settling chamber, instead of on top of the filtering material, to clog up and interfere with the filtering process.

3rd. Cheapness of the filtering material, viz.: saw dust. It does not have to be removed oftener than four weeks to four months, according to use.

4th. Accessibility of all parts.

5th. The perfect way in which it does its work. It is an eye opener to see oil before and after being filtered in this filter.

6th. Every bit of oil that can be scraped from the floor, or taken from the drip pans, can be used over and over again, and improves with age.

7th. It is an ornament to any engine room, and an incentive to keep the room clean.

8th. It will pay for itself in a short time.

9th. The builder has such confidence in it that he is willing to send it on trial to responsible parties, and if it is not all he claims for it, it can be sent back without costing a penny.

10th. It is pronounced to be the best oil filter by some of the best power users in New England, whose affidavits are on file. Where there is an engine of 50 H.P., or upwards, this oil filter will pay for itself in a short time.

Two Sizes. No. 1 will filter from 10 to 15 gallons a day. No. 2 will filter a barrel a day.

Price very reasonable. Send for circular.

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O. K. Soap Co.

Dyeing and finishing wo·ks of all sections are well acquainted with the soaps, ·oftener·, silkenes, sizing finish, etc. of the O. K. Soap Co., of Philadelphia. Their cotton softener, extra finish, silkene for dyeing and silkene for fast black imparts a superior finish and is widely used by the leading works. The company report a steady call for their specialties which are mentioned in their card in our April, 1896 issue.

—More attention is being paid each succeeding year to the health of employees in mills and factories. As a producer of pure air, a perfect disinfectant and a destroyer of noxious germs and unhealthful gases, Bosson & Lane, 36 Central Wharf, Boston, are offering a new preparation under the name of "Dulcoro." It is odorless, colorless, efficacious and economical, and should be freely used as a disinfectant in all mills. The price ranges from 50 cents per gallon in kegs down to 30 cents in barrels, and at these prices ought to find a ready sale. Further particulars and samples may be obtained from the firm named above.

—A neat brochure of 54 pages, setting forth the merits of the Sturtevant forges, has been received from the B. F. Sturtevant Co., Boston. The vital portion of hand forges is of necessity the blower, and their record of over a third of a century as manufacturers of blowers may be taken as the strongest evidence of the excellence of the forges to which they are applied. All known improvements have been introduced, and the utmost care combined with long experience has been brought to bear in perfecting the design of these forges. Besides showing cuts of all the various sizes and shapes of forges, a few of the shops equipped by this company are grouped together at the close of the pamphlet.

—Blaisdell's automatic feeder is a labor saving device for reducing the cost of running thread extractors and card and picker waste machines to the lowest possible amount. The feeders will largely obviate the danger from fire, require comparatively little time for attention, and the claim is made that they will pay for their cost in six months' use. Blaisdell & Page, 29 Oliver St., Boston, will supply the fullest information. The machine is illustrated elsewhere in this issue.

—The Birmingham Cotton Mfg. Co., Birmingham, Ala., through H. G. McKerrow & Co., Boston, have put in a line of Tweedales & Smalley's speed frames.

—In our April edition, W. D. Dounton was incorrectly reported as buyer for W. D. Dounton's Sons, Philadelphia. John Barrows is the buyer for the firm.

—John Oscar Erckens, late of the firm of Hinck & Ould, has transferred his foreign woolen accounts, including J. G. Merckens, J. Cupper Sohn and Aloys Knops, to H. Bauendahl & Co., 76-78 Leonard St., New York.

Facts and Gossip.

—CONNECTICUT, Vernon. The Granite Mills Co. has been organized here with a capital of $25,000, in 250 shares of $100 each, $5000 of which is paid in cash, and $20,000 in property.

—NEW YORK, Brooklyn. Juno J. Kelly is now sole proprietor of the Imperial Knitting Mill, the partnership previously existing with Mr. Kelly and Mr. Stanels having been dissolved. The business will be continued under the same name as heretofore.

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FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

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This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the North-Western States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

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BOSTON, MASS

Facts and Gossip.

—GEORGIA, Marietta. John J. Hefferman and S. A. Anderson, who have been negotiating for the purchase of the New Albany Cotton Batting Mill, located at New Albany, Ind., have finally closed a deal with the owner, Lawrence Bradley, for the purchase of the machinery, which includes the cards, folders, lappers, pickers, etc., which will be moved to this place.

—MASSACHUSETTS, Lowell. At a meeting of the stockholders of the Lawrence Mfg. Co. they confirmed the action of directors to reduce the capital stock one half, to $750,000, and the directors were authorized to sell the cloth manufacturing plant.

—MASSACHUSETTS, New Bedford. The new Whitman Mills started up on Thursday. All the machinery has been set in motion.

—MASSACHUSETTS, New Bedford. The Dartmouth Mfg. Corporation have a large number of fitters now at work erecting the picking machinery, revolving flat cards and drawing frames ordered by them with the American Machine Co., of Pawtucket. The slubbing, intermediate and roving frames are being supplied by C. E. Riley & Co., Boston.

—MASSACHUSETTS, Taunton. It is said that negotiations are now pending for locating in this city the American branch of an English house, which will make goods never before manufactured in America.

—MISSOURI, Independence. The Independence Wool Manufacturing Co. has been reorganized by the old firm that owned it several years ago. John A. McCoy, James McAfee and John McAfee are the members of the firm. They will open warerooms in the new Music Hall building.

—NEW YORK, Cohoes. The sale of the Vredenburgh Knitting Mill and stock, under judgment held by Critten, Clift & Co., of New York, has been concluded. The mill and machinery were bid in by Critten, Clift & Co., the judgment creditors for $10,000. The amount received from the sale of plant and stock makes a total of $20,500. Critten, Clift & Co.'s claim aggregates over $26,000.

—NEW YORK, Cohoes, Apr. 18, '96. The Lion Knitting Mill, which was closed on a chattel mortgage amounting to $3327, was sold by the Manufacturers' Bank, to John Loughlin & Son and Nedard Brault. The stock, machinery, etc., was purchased for $2445 by John Loughlin.

Knitting Mill Help WANTED.

Three or four families experienced in the various branches of underwear manufacture can find steady employment at the Dudley Mills Newton Lower Falls, Mass.

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TEXTILE WORLD'S INFORMATION DEPARTMENT,
620 Atlantic Ave., Boston, Mass.

SITUATIONS WANTED.

W. H. COTTON.

A practical mill man is in charge of the Information Department and Overseer's Bureau.

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Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

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WOOLEN SUPERINTENDENTS.

1085 **Designer, Assistant Designer** or Assistant Superintendent. Has experience on cassimeres, cloakings, meltons and dress goods. Will take a position anywhere in U. S. or Canada. 23 years of age

881 **A thorough practical manufacturer** and designer wants superintendency or designing position. Served his apprenticeship in English mills. Young, but widely experienced. Has worked on worsteds, scotch cheviots, uniform goods, overcoatings, cassimeres, chinchillas, dress goods and cloakings. Can furnish excellent references; 28 years of age.

930 **Asst. Supt, overseer of weaving** and designing. Has worked on all kinds of men's wear, dress goods, kerseys beavers, etc. Age 43; married.

880 **Superintendent or Designer** in large mill. Has had large experience in the designing and manufacture of nearly all kinds of goods made in a woolen mill. Has been superintendent and designer for the past 25 years. Has the best of references. Is 49 years of age and married. Has worked on suitings, coatings, cloakings and overcoatings in worsted and wool, fancy cassimeres, wool and piece dyed cheviots, shawls, flannels, blankets, beavers, skirts, etc. Will go anywhere excepting Canada.

1125 **Woolen Superintendent** wants position. A good man on cassimeres, dress goods, flannels and blankets. Has been overseer 3 years and superintendent 12 years for the same company. Age 37 and married. Will go anywhere except Canada. Good references.

942 **Is Expert on Woolens, Worsteds** and dress goods. Desires a position as superintendent, or assistant superintendent and designer, or designer alone. Has worked in best New England mills. Salary $2000 per annum.

856 **Superintendent and Manager.** Experienced on blankets, flannels dress goods, wool and worsted. Has had thirty years' experience. Can give best of references. Unmarried. Salary and part interest can be arranged with proper parties. Has a knowledge of trade, having sold goods direct for the mill.

912 **Superintendent or boss carder,** good references. His forte flannels, dress goods satinetts, union cassimeres. 41, family. Salary moderate.

1023 **A Good Woolen Mill Superintendent.** Experienced on fancy cassimeres, worsteds, fancy and piece dye, cheviots, overcoatings, kerseys, beavers, cloakings, friezes, etc. Salary, moderate, Age, 38 years. Married.

1055 **Woolen Superintendent or** Assistant. Superintendent and designer. Will take a position as designer in a good mill. Age 36, married. Has worked on all kinds of woolen goods, such as beavers, kerseys, cheviots, chinchillas, flocko, neys, cassimeres, medium grade worsteds serges and all kinds of nap goods. Salary governed by position.

1067 **Woolen Superintendent.** Is a practical weaver and designer. Has worked in some of the best mills in New England. Has experience on worsteds, beavers, kerseys, union cassimeres and fancy cassimeres. Is at present unemployed. Prefers position in N. Y. or N. E. states. Will work for $1800 per year and upwards. Age, 44 years; married. Has the best of references as to ability and character.

816 **A first class superintendent,** now employed, desires to change. Very extended acquaintance with all classes of worsted and woolen cloths. Invites correspondence.

1029 **Superintendent or Designer.** Here is a good man for a responsible position. Has worked on all kinds of men's wear, woolens and dress goods. Is 35 years old and married, and has had an experience of 10 years as superintendent and designer. Will work for salary according to size of the mill.

771 **An excellent Supt.** for any woolen mill needing a man with his experience on cassimeres and dress goods. A good manager of help. Salary moderate.

COTTON SUPERINTENDENTS.

1114 **Superintendent and Overseer,** wants position on cotton goods, has had a first-class experience, and can furnish first-class references. Will go anywhere; age 39 and married; salary reasonable; is a first class man on seamless bags.

1056 **Cotton Superintendent.** Experienced on fine and coarse yarns, rope, twine, mops, etc. Age 29, unmarried. Good references. Salary $30 per week.

911 **Colored cotton, worsteds, and** cassimeres, 11 years superintendent in 3 different mills, 44 years of age, married.

934 **Ginghams, cotton dress goods,** shirtings, cotton and woolen, both fine and coarse, also cheviots. High up in his knowledge of these goods. Experience gained in Scotch mills. Is a practical dyer and finisher, and a practical designer. Desires a position as agent or superintendent, or as superintendent and designer. Age 42; married.

1016 **Very desireable man,** wishes a superintendency. Strong point weaving, spooling, warping and dressing, but has also done good work in designing. Shirtings, sheetings, ginghams, ducks, demins, etc., etc. Is 35 and married.

1108 **Cotton Superintendent or Mule** spinner. Has good references, and a first-class record. Will go anywhere. Age 40; married. Familiar with prints, silks and hosiery.

WOOLEN CARDERS.

932 **Carder and spinner** in 3 to 5 set mill. Has worked on fine dress goods and cassimere stock. Age 29; married. Wages $3.00, or so.

710 **Low stock his strong point,** but has carded all kinds of stock. Age 40; married. Salary $3.00.

1082 **Woolen carder experienced on** all classes of underwear. Has worked for eight years in one mill, 29 years of age and married. Good references.

1030 **Woolen Carder.** A first class man with good references and wide experience desires position as overseer of woolen carding. Has worked on from fine wool to low shoddy. Age 27. Married and can take position at once. A trial will show that he is the right man.

1051 **Has had 27 years' experience** in woolen mills. Has carded satinets, hosiery, flannels, cassimeres, shoddy and all sorts of stock and goods. Excellent references. Age 45, married. Salary not less than $3 per day.

836 **Strong point, hosiery,** but has also carded extensively for dress goods, flannels, tweeds, etc. Age 35. Salary moderate.

COTTON CARDERS.

1109 **Card Room, Cotton.** Man wants position as overseer or second hand. Age 35 and married. Will go anywhere. $2.00 per day.

1122 **Overseer of Cotton Carding** wants position; will not go South or West; familiar with sheeting, print, shirting, and hosiery yarns, also warp yarn; good references; age 32 and married.

978 **Overseer of Carding,** coarse and fine yarns and combings. Will work for $2.50 and upwards. 46 years old, married.

1001 **Has Carded** for ginghams, sheetings, checks, prints, etc., and is first class. Age 34, married. Wages $2.50 and up.

910 **Is a good carder** on plain, colored and fancy white stock. Age 41. $2.50 and up.

1072 **Cotton Carder.** Experienced on mixed and colored hosiery and fine yarns, and print cloths. Has worked wholly in New England, but will take position anywhere.

WOOLEN SPINNERS.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

1111 **Overseer of Spinning** wants position. Age 48 and married. Has good recommendations from last employers. Has worked on cassimeres, wool shoddy, fancy elderwown and flannels. Will go anywhere.

1017 **Boss spinner** on stock for cassimeres, beavers, cheviots, flannels and woolen shirting. Age 29, married. Wages $2 50.

COTTON SPINNERS.

1063 Overseer of ring spinning. Is a good man, and has the best of references. Age 27 years, married. Experienced on ginghams, sheetings, etc. Salary $3.00 and up.

1068 **Cotton Ring Spinner.** Understands spooling, warping and twisting. Has worked on yarns from 4s to 70s. Age 30 years. Will take good second hand job. Salary from $2.00 to $3.00 per day.

1036 **Learnt his trade as spinner in** one of the best mills in Mass. Has worked fine and coarse, colored and white goods; 14 years experience. Is 38 years of age, married Good references. Will work for $3.50 per day at the lowest.

1058 **A Cotton Spinner of the First** Rank. Understands thoroughly twisting, drafting, and spinning the different classes of cotton. A good mechanic and an expert on copping. Has worked on flannels, prints, fine cotton underwear and sale yarns. Age 40, married. Salary $3 to $4 per day. Will go anywhere in the United States.

1061 **Experienced on anything in** the cotton line, as overseer of spooling, warping and slashing. Has the best of references as to ability and character. Is an A1 man, and can make his department pay. Age 47 years, married. Will work for $3.00 to start with.

1121 **Overseer of Ring Spinning.** wants position. Can run spinning, spooling, warping or reeling. Good references. Age 34 and married.

1123 **Overseer of Spinning** wants position. Understands Parr & Curtis and Lee mules, and is familiar with all kinds of frames, also spoolers and warpers. Will go anywhere. Age 47; married. Can refer to past employers.

1128 **Overseer of Ring Spinning.** French. Age 28; single. Prefers New England States. Experienced on Mason and Whittin frames. Has had a good experience as second hand. Refers to past employers.

826 **Has worked in best New England** mills; as second hand, and capable of taking an overseership in medium or small mill. Age 31.

COTTON WEAVERS.

1037 **Has 19 years experience** in cotton weaving. Can work all kinds of greys. Has good references, and is an excellent workman. Will go anywhere in the U. S. Is 35 years old and married. Salary depends on size of position.

1052 **A1 Cotton Weaver.** Has worked for 12 years as overseer of weaving in one of the largest cotton mills in New England Age 39, married. The best of references. Will work for $3 per day to start.

938 **Experienced on Checks**, duck, sheeting, drilling, cottonades, awnings.

1073 **Cotton Weaver.** Ginghams, fancy dress goods, shirtings, sheetings, leno and silk jacquard work; 25 years of age. Will take position anywhere in United States.

1113 **Overseer of Weaving** woolen or cotton goods; age 30 and married. Will work for moderate pay until ability is proven. Will go anywhere. Has a thorough knowledge of box looms and plain. Can furnish good references if required.

1110 **Overseer of Cotton Weaving**, fancy or plain. Age 42; German. Wants position as overseer, or will take second hand's position. Has had charge where first-class goods are made. Good references.

745 **Overseer and Designer** wants position on cotton goods; age 48 and married; refers to past employers; will go anywhere; has two fancy web drawers in family.

1127 **Overseer of Weaving.** French. Age 36; married. Understands sheetings, drills and prints. Will go anywhere. Out of work; mill stopped. Refers to past employers.

WOOLEN WEAVERS.

1020 **Woolen weaver, first class man.** Experienced on cassimeres, dress goods shawls, flannels, etc. Good references.

1004 **Now in the West**, good weaver. Experienced also in the best Eastern mills. Has worked on cassimeres, meltons, cheviots, beavers, cloakings, worsteds. Is 38 and married.

1115 **Overseer of Weaving** wants position in woolen mill; age 50 and married; mill stopped, cause of being out of a position; is a reliable man, first-class references; has worked on dress goods, carriage cloths, blankets, etc.

1117 **Overseer of Weaving** wants position; age 36, and married. Has worked on unions, beavers, kerseys, worsteds, etc. Good references. Will go anywhere, except Canada.

1043 **Desires job in a good** Southern mill as overseer of weaving or superintendent. Has had experience on plain and fancy goods of all kinds. Will take a position anywhere in the United States or Canada. 47 years of age, married. Will work for $3.00 and upwards.

997 **Cotton and Woolen Weaver.** Has worked on plain and fancy dress goods, cassimeres and worsteds; wages $2 50 and more per day. Age 45, married. Furnishes excellent references.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels Will not go South, West or Pennsylvania.

FINISHERS.

896 **Woolen Finisher.** 30 years of age, married. Has worked on cassimeres, dress goods, worsteds and cheviots. Good references.

1086 **Overseer of Wet Finishing.** Age 34. Experienced on all kinds woolen goods and faced goods. Will go anywhere. $3 per day.

1089 **Overseer of Knitting.** Age 27 and married. Experienced on light and heavy weights, woolen and cotton. Will go anywhere. Wages $2.50 per day.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassmeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2 50 per day.

1007 **Dress goods and fine meltons** prefered, but has worked on all kinds woolens, N. Y. or N. E. states. Age 22. salary moderate

928 **Foreman dyer and finisher** of knit goods. Very extended experience on all kinds of cotton, wool, and mixed goods, in hosiery, underwear, and overshirts.

1086 **Overseer of Finishing**, or will accept a position as cloth inspector in a clothing manufacturing establishment. Experienced on all kinds of woolen goods. Will go anywhere. $3.00 per day.

DYERS.

1075 **Dyer. Has had good experience** on dress goods and men's wear. 2[illegible] years of age. Good references.

1049 **Boss Dyer and Finisher.** Cassimeres, kerseys, piece dyed goods, etc. Would take management of 2 or 3-set mill. Is a practical carder and spinner, with knowledge of weaving. 50 years of age. Good references.

1105 **Boss Dyer, Woolen, or Will** take position as second hand for a while. Age 23. Not married. Good references. Wages reasonable.

937 **Boss Dyer of the very First** Rank. Strong points; cotton, woolen, and merino yarns, raw cotton and wool, all kinds of hosiery.

1026 **Overseer of Dyeing.** A first class dyer, 40 years of age, and married. Has worked on woolen and worsted piece goods, slubbing, worsted and mohair yarns. Will work for $4 per day and upwards. Can give best of references, and can take position at once.

1031 **Dyer**, who has worked on raw stock, wool and hoddy and woolen yarns of all grades from fine worsteds down to low carpet yarns, piece goods, heavy woolens, desires position. Age 40, married. Has worked with one mill eight years and can give good references.

1042 **Dyer.** Has worked on all kinds of goods. Has had good experience in many New England mills. Age 45 years. Salary $3 to $5 per day. Excellent references. Will go anywhere.

1057 **A Good Dyer.** Is experienced on cotton and woolen hosiery, cider downs, cashmerettes, dress goods, linings, piece warps, skein, fancy and raw stock. Age 25 years, married. Salary between $3 and $4 per day.

KNITTERS.

1028 **Overseer of Knitting.** Has worked on cotton underwear and hose, and held position as second hand for over seven years. He is 27 years old and married. Is willing to start at $3 per day, with prospects of more.

1024 **Overseer of Knitting.** Is at present employed, but desires to change. Has had over six years' experience on wool and cotton, heavy and light. Will accept any reasonable salary.

1066 **Knitter.** Experience on cotton, woolen and worsted goods. 24 years of age. Will take position anywhere in United States. Salary $3 to $4 per day.

1054 **Boss Knitter.** Has worked on hosiery in wool and cotton. 40 years old, married. Good references. Will work for $75 or $80 per month. Will also take a position as machinist.

889 **Knitter or Machinist.** Has had experience on all kinds of underwear; 27 years of age; married. Is well recommended. Has worked in some of the best mills in the country. Can take a position at once.

1025 **Superintendent or Overseer of** Knitting. Has been boss knitter with one mill ever since it started, 12 years ago. Has had long experience, and can give good references. Married. 46 years of age.

1074 **Superintendent of Knitting** Mill. Is a practical finisher. Strong point hosiery, but has also worked on underwear. Has good references. 52 years of age. Married. Will take a position anywhere in the U. S.

888 **Knitting Superintendent.** Experienced on rib and cut goods, all grades and gauges, from 14 to 28 gauge, all wool and all cotton. Has been overseer of carding and also of finishing. Young, but has a wide experience. 28 years of age; married.

1129 **Overseer of Knitting** wants position. A good man on latch needle knitters. Understands sewing machines. Has worked on novelty swiss rib underwear and is a thorough man on Scott & Williams and Nye & Tredick machines. Wages reasonable; age 30.

1126 **Knit Superintendent** wants position. American. Age 38; married. Familiar with nearly all kinds of machinery and hosiery. Does not care to go West or to Canada. Has good references from past employers.

MISCELLANEOUS.

1038 **Master Machinist or Foreman.** Will give 30 days trial for expenses. Has experience on light and heavy goods repairs. Age 31 years, married. Salary $3.50 per day.

1046 **Knitter.** Desires to go South on Branson, Brinton and Keystone machines. Experienced on all kinds of cotton and woolen hosiery; 36 years of age; married.

887 **Overseer of Spooling** in a knit or cotton mill. Is competent to take superintendency of a knitting mill. Is experienced principally on fine underwear. 33 years of age; married. Will not go South or to Canada.

176 **South preferred.** Understands fixing a loom, and not afraid to do it. Gets on well with Southern help.

840 **Beaming or Charge of Beaming.** Has worked on ginghams, ticklings, shirtings and dress goods. Age 29; married; salary as beamer $2.50; in charge $2.75.

1044 Overseer of Boarding and Finishing Hosiery. Experienced on cotton, woolen and mixed, seamless and fashioned goods. Will work for two dollars per day. Age 41 years, married. Good references. Will go anywhere in the United States, excepting the West.

533 **Situation wanted** as superintendent in flax, hemp or jute mill. Can make all kinds of yarn, threads, sail twines. Best of references as to character and ability. Twenty years experience in the same line, both wet and dry spinning.

1069 **Overseer of Fulling and Scouring.** Has had experience on all kinds of tweeds, beavers, meltons, shoe cloths, Irish friezes, overcoating, blankets, silks, dress goods and worsteds; 37 years of age; married. Will take a position anywhere. Salary very reasonable.

914 **Mechanical engineer and cotton** mill superintendent, English, of high character and ability, wants a position in the South as superintendent, or would undertake the erection and starting up of cotton mills.

998 **First-Class Sewing Machine Fixer** and Finisher in knitting mill. Has worked on all kinds of shirts and drawers. Furnishes best of references. 45 years old, married. Wages $2.50 to $3.50 per day.

1087 **Overseer of Beaming, Designing** or Weaving. 35 years of age. Married. Has worked on dress goods, silk striped shirtings, pantaloon goods, ginghams, etc. Highly recommended. Will go anywhere in the United States.

1118 **Millwright, Machinist or Engineer,** wants position. Will go anywhere; age 35 and married. Willing to work for small pay at the start. First-class references.

1116 **Cloth Examiner and Shipping** Clerk wants position in finishing room; age 31; good references; will go anywhere; long experience on dress goods, worsted, cassimeres, meltons, etc.

1119 **Salesman,** wants position selling dyestuffs. Is a thoroughly posted man in this line; can refer to past employers. Will go anywhere. Age 41 and married.

927 **Boss Dresser Tender.** Five years overseer on stock for cassimere, flannels, worsteds, kerseys, beavers, dress goods and all other kinds of woolens.

1124 **Bleacher** wants position. Age 50; married. Has been employed in a first class bleachery for several years, and can furnish good references. Will go anywhere. Wages moderate.

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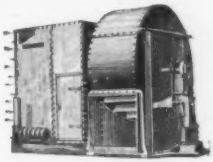

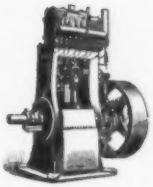

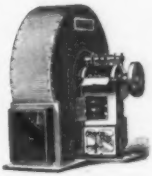

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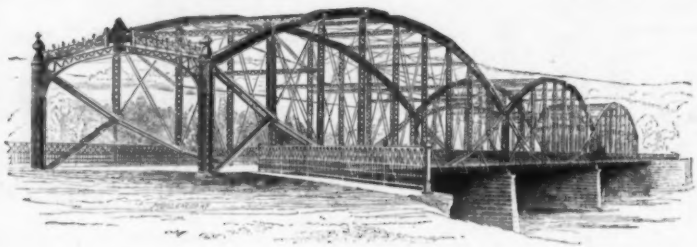

The above illustration, taken direct from a photograph, shows the construction of a Parabolic Truss Bridge, designed and built by us for the city of Binghamton, N. Y. The bridge consists of three spans of 165 ft. each, with a roadway 24 ft. wide in the clear, and two sidewalks each 6 ft. wide in the clear.

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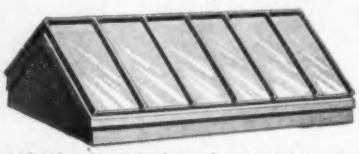

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